SEQUENCE LISTING

<110> Hresko, Michelle Coutu
McLaird, Merry B.
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Kloek, Andrew P.
Davila-Aponte, Jennifer A.
Bradley, John D.
Xu, Siqun

<120> NEMATODE PAN AND ZP RECEPTOR-LIKE
SEQUENCES

<130> 12557-015001

<140> US 10/771,708
<141> 2004-02-04

<150> US 60/444,771
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ata ttt tta att tca act aat ata gca tct aaa att tct ggt gtt cca   158
Ile Phe Leu Ile Ser Thr Asn Ile Ala Ser Lys Ile Ser Gly Val Pro
 15   20   25   30

tta tgc aac aaa gat act tca cca gta ttt aca ctt caa cat aat tct   206
Leu Cys Asn Lys Asp Thr Ser Pro Val Phe Thr Leu Gln His Asn Ser
                 35   40   45

act aat ggt att tta gct aga tct ctt cca caa cca gga tta att gat   254
Thr Asn Gly Ile Leu Ala Arg Ser Leu Pro Gln Pro Gly Leu Ile Asp
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Trp Gln Gly Ile Cys Arg Val Ile Ser Gln Asp Lys Thr Ser Ile Tyr
        80                  85                  90

aca cca aca gat gaa act tca ata ctt tta aca aaa tca tgt gtt aaa    398
Thr Pro Thr Asp Glu Thr Ser Ile Leu Leu Thr Lys Ser Cys Val Lys
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agt gat cgt ata tgt tca tca cca ttc cat ttt gat gtt tat gaa caa    446
Ser Asp Arg Ile Cys Ser Ser Pro Phe His Phe Asp Val Tyr Glu Gln
                115                 120                 125

aaa ata tta gtt gga ttt gct aga gaa gtt gta cca gct gag tct att    494
Lys Ile Leu Val Gly Phe Ala Arg Glu Val Val Pro Ala Glu Ser Ile
                130                 135                 140

gaa att tgt atg gct gct tgt ttg aat gct ttt gat aca tat ggt ttt    542
Glu Ile Cys Met Ala Ala Cys Leu Asn Ala Phe Asp Thr Tyr Gly Phe
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gaa tgt gaa tca gct atg tat tat cca gtt gat agt gaa tgt att ctt    590
Glu Cys Glu Ser Ala Met Tyr Tyr Pro Val Asp Ser Glu Cys Ile Leu
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aat act gaa gat aga ctt gat cga cca gat ctt ttt gtt gtt gaa aaa    638
Asn Thr Glu Asp Arg Leu Asp Arg Pro Asp Leu Phe Val Val Glu Lys
175                 180                 185                 190

gaa gat gtt gtt tat tat ctt gat tct aat tgt gct ggt tca caa tgt    686
Glu Asp Val Val Tyr Tyr Leu Asp Ser Asn Cys Ala Gly Ser Gln Cys
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tat gct cca tac att aca caa tat att gct gtt gaa aat aaa caa ata    734
Tyr Ala Pro Tyr Ile Thr Gln Tyr Ile Ala Val Glu Asn Lys Gln Ile
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gaa aat gaa tta gat aga aaa ttt gaa aat att gat ttc caa aca tgt    782
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gaa gaa tta tgt act ggt aga att act gtt aca caa aat gat ttt act    830
Glu Glu Leu Cys Thr Gly Arg Ile Thr Val Thr Gln Asn Asp Phe Thr
        240                 245                 250

tgt aaa tca ttt atg tat aat cct gaa aca aaa gtt tgt tat ctt tct    878
Cys Lys Ser Phe Met Tyr Asn Pro Glu Thr Lys Val Cys Tyr Leu Ser
255                 260                 265                 270

gat gaa cgt tca aag cct ctt gga cgg gct aaa tta agt gat gct aat    926
Asp Glu Arg Ser Lys Pro Leu Gly Arg Ala Lys Leu Ser Asp Ala Asn
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gga ttt act tat tat gaa aaa aaa tgt ttt gca tct cca aga aca tgc    974
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        305                      310                  315

ttt gct gca ttt gtt atg gaa aat gta cca tct gtt act atg tgc ctt      1070
Phe Ala Ala Phe Val Met Glu Asn Val Pro Ser Val Thr Met Cys Leu
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gat caa tgt aca aat cca cca cca gag aca ggt gaa aaa ttt gtc tgt      1118
Asp Gln Cys Thr Asn Pro Pro Pro Glu Thr Gly Glu Lys Phe Val Cys
335                  340                  345                  350

aaa tct gtt atg tac tat tat aat gaa caa gaa tgt att ctt aat gct      1166
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gaa aca aga cat aca aag cca gat ctt ttt att aca gaa gga gat gaa      1214
Glu Thr Arg His Thr Lys Pro Asp Leu Phe Ile Thr Glu Gly Asp Glu
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ttt ctt gtt gat tat ttt gat att tca tgt cat ctt gaa cca gaa aca      1262
Phe Leu Val Asp Tyr Phe Asp Ile Ser Cys His Leu Glu Pro Glu Thr
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tgt cct aaa gga aca tat tta aaa gga att aaa tct atc aat tct gca      1310
Cys Pro Lys Gly Thr Tyr Leu Lys Gly Ile Lys Ser Ile Asn Ser Ala
        400                  405                  410

ctt cct gag ggt gaa ggc tca ctt cat gtt att gag tct gct gga aaa      1358
Leu Pro Glu Gly Glu Gly Ser Leu His Val Ile Glu Ser Ala Gly Lys
415                  420                  425                  430

tca tta gaa gaa tgt atg gaa aaa tgt aac caa ctt cat cca gaa aaa      1406
Ser Leu Glu Glu Cys Met Glu Lys Cys Asn Gln Leu His Pro Glu Lys
                435                  440                  445

tgt aga tca ttt aat ttt gaa aaa tca tct gga tta tgt aat ctt tta      1454
Cys Arg Ser Phe Asn Phe Glu Lys Ser Ser Gly Leu Cys Asn Leu Leu
                450                  455                  460

tat ctt gat gga aaa aat act tta aaa cca ttt att aaa aat gga ttt      1502
Tyr Leu Asp Gly Lys Asn Thr Leu Lys Pro Phe Ile Lys Asn Gly Phe
        465                  470                  475

gat ctt gtt gat tta caa tgt tta tca act aaa aaa gat tgc tct aca      1550
Asp Leu Val Asp Leu Gln Cys Leu Ser Thr Lys Lys Asp Cys Ser Thr
        480                  485                  490

aaa aag aat gat att aat ttt gtt aaa tat ctt tac tct cat ttt gtt      1598
Lys Lys Asn Asp Ile Asn Phe Val Lys Tyr Leu Tyr Ser His Phe Val
495                  500                  505                  510

aaa tat ctt tac tct caa caa cct gga att cca aca aaa aca gaa aaa      1646
Lys Tyr Leu Tyr Ser Gln Gln Pro Gly Ile Pro Thr Lys Thr Glu Lys
                515                  520                  525
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gtt att ggt att tct aaa tgt ctt gat tta tgt act gat agt gaa cgt      1694
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tgt gaa gga ctt aat tat aat aga aga act gga gaa tgt caa tta ttt      1742
Cys Glu Gly Leu Asn Tyr Asn Arg Arg Thr Gly Glu Cys Gln Leu Phe
            545             550             555

gaa att att gat gga cct tct aat ctt aaa aaa tct gag cat ata gat      1790
Glu Ile Ile Asp Gly Pro Ser Asn Leu Lys Lys Ser Glu His Ile Asp
        560             565             570

ttt tat caa aat ctt tgt tct act aaa gaa aat gaa gct ggt gtt tca      1838
Phe Tyr Gln Asn Leu Cys Ser Thr Lys Glu Asn Glu Ala Gly Val Ser
575             580             585             590

tct gca tta aat gta cca caa tca tct gtt att cct att tca tca tca      1886
Ser Ala Leu Asn Val Pro Gln Ser Ser Val Ile Pro Ile Ser Ser Ser
            595             600             605

caa aat att agt aaa agt gat gtt ttt gcc aaa aaa aat ctt aat aaa      1934
Gln Asn Ile Ser Lys Ser Asp Val Phe Ala Lys Lys Asn Leu Asn Lys
            610             615             620

gat ggt aat aat caa gta aac att tat gaa cca gaa aaa aaa tac cat      1982
Asp Gly Asn Asn Gln Val Asn Ile Tyr Glu Pro Glu Lys Lys Tyr His
        625             630             635

cca aaa gga tca aaa aat gaa aca tca tat gaa aca gga act gta aat      2030
Pro Lys Gly Ser Lys Asn Glu Thr Ser Tyr Glu Thr Gly Thr Val Asn
        640             645             650

aaa tca aat gtt gaa gag gtt tct gaa act tta act aat agt gga gtt      2078
Lys Ser Asn Val Glu Glu Val Ser Glu Thr Leu Thr Asn Ser Gly Val
655             660             665             670

gaa agt gga agt ctt gaa aaa aat att att aca gca cca cca tct ata      2126
Glu Ser Gly Ser Leu Glu Lys Asn Ile Ile Thr Ala Pro Pro Ser Ile
            675             680             685

cca aaa att cct gaa ggt cca cta cca gtg cca att tta att cca gct      2174
Pro Lys Ile Pro Glu Gly Pro Leu Pro Val Pro Ile Leu Ile Pro Ala
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gat caa gta caa act att tgt gat tat gaa ggt att aaa gta caa att      2222
Asp Gln Val Gln Thr Ile Cys Asp Tyr Glu Gly Ile Lys Val Gln Ile
            705             710             715

aaa tca cca caa tca ttt act ggt gtt atc ttt gtt aaa aat cac tat      2270
Lys Ser Pro Gln Ser Phe Thr Gly Val Ile Phe Val Lys Asn His Tyr
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gaa aca tgt cgt gtt gaa gtt tcc aac tct gat gca gct act ctt gag      2318
Glu Thr Cys Arg Val Glu Val Ser Asn Ser Asp Ala Ala Thr Leu Glu
735             740             745             750
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ctt ggt ctt cca gct tca ttt gga atg aaa cca gtt aca ctg tct gct        2366
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aca tct tca gat tct acc tct tca cag aat att act tct aat agt gga        2414
Thr Ser Ser Asp Ser Thr Ser Ser Gln Asn Ile Thr Ser Asn Ser Gly
            770                 775                 780

cat aaa gtt gtt gga aga gca cgc cgt gat aca caa gaa aaa tct tgt        2462
His Lys Val Val Gly Arg Ala Arg Arg Asp Thr Gln Glu Lys Ser Cys
            785                 790                 795

ggt ctt aca gaa att gaa aat gga aaa tat aaa agt act gtt gtt ata        2510
Gly Leu Thr Glu Ile Glu Asn Gly Lys Tyr Lys Ser Thr Val Val Ile
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caa aca aat aac ctt gga att cct gga ctt gta aca tca aca gat caa        2558
Gln Thr Asn Asn Leu Gly Ile Pro Gly Leu Val Thr Ser Thr Asp Gln
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att tat gaa att ggt tgt gat tat agt agt atg tta gga gga aaa att        2606
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act aca gca gct aat atg act gta aat gga cca aca cca act gat att        2654
Thr Thr Ala Ala Asn Met Thr Val Asn Gly Pro Thr Pro Thr Asp Ile
            850                 855                 860

aaa cct aga ggt aaa att gaa ctt gga aat cct gtt ctt atg caa atg        2702
Lys Pro Arg Gly Lys Ile Glu Leu Gly Asn Pro Val Leu Met Gln Met
            865                 870                 875

aat gct ggt aca ggt gat cat cag cca att tta caa gct aaa ctt gga        2750
Asn Ala Gly Thr Gly Asp His Gln Pro Ile Leu Gln Ala Lys Leu Gly
            880                 885                 890

gat att ctt gaa tta aga tgg gaa att atg gct atg gat gaa gaa ctt        2798
Asp Ile Leu Glu Leu Arg Trp Glu Ile Met Ala Met Asp Glu Glu Leu
895                 900                 905                 910

gat ttc ttt gtt aaa gat tgt cat gca gaa cct ggt act ggt gct gga        2846
Asp Phe Phe Val Lys Asp Cys His Ala Glu Pro Gly Thr Gly Ala Gly
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gga gat gaa aaa ctt cag ctt att gaa ggt gga tgc cca aca cca gct        2894
Gly Asp Glu Lys Leu Gln Leu Ile Glu Gly Gly Cys Pro Thr Pro Ala
            930                 935                 940

gtt gct caa aaa ctt att cca caa cca ata aaa tta caa tca tca gct        2942
Val Ala Gln Lys Leu Ile Pro Gln Pro Ile Lys Leu Gln Ser Ser Ala
            945                 950                 955

gtc aaa att gcc cat ctt caa gct ttc cgt ttt gat tca tcc tct tca        2990
Val Lys Ile Ala His Leu Gln Ala Phe Arg Phe Asp Ser Ser Ser Ser
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Ala Thr Cys Asp Met His Gly Glu Ser Lys Gln Ser Trp Gly Arg Lys
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aag aga cat att gaa gat gat aca att aca gaa ttt gag aca aat cgt      3134
Lys Arg His Ile Glu Asp Asp Thr Ile Thr Glu Phe Glu Thr Asn Arg
            1010                1015                1020


tat aaa gtt cca aga ttt tca caa gca aca aca tct ctt tta att ctt      3182
Tyr Lys Val Pro Arg Phe Ser Gln Ala Thr Thr Ser Leu Leu Ile Leu
        1025                1030                1035


gat cca ctt caa aat aac att gaa cca gca tca tta atg tca aaa gta      3230
Asp Pro Leu Gln Asn Asn Ile Glu Pro Ala Ser Leu Met Ser Lys Val
        1040                1045                1050


tca tct ctt gat ttg tta gct gaa gat cct gca aaa aca tta ctt aag      3278
Ser Ser Leu Asp Leu Leu Ala Glu Asp Pro Ala Lys Thr Leu Leu Lys
1055                1060                1065                1070


att aaa gag act gca cat ttg aat gga aat ctt tgt atg gga aaa att      3326
Ile Lys Glu Thr Ala His Leu Asn Gly Asn Leu Cys Met Gly Lys Ile
                1075                1080                1085


aca ctt ttc tca gta ttt ggt gtt ctt ctt tca tta att gtt gtt caa      3374
Thr Leu Phe Ser Val Phe Gly Val Leu Leu Ser Leu Ile Val Val Gln
                1090                1095                1100


gca att gtc gta aca aat tat att ttt aaa aga gtt atg tca agc aga      3422
Ala Ile Val Val Thr Asn Tyr Ile Phe Lys Arg Val Met Ser Ser Arg
        1105                1110                1115


aag att acc aat taaactttaa taattaaaca ataattataa atatgccttt          3474
Lys Ile Thr Asn
        1120


atgttctcaa aacgagtata atcctttttt ttgttattaa ttttagtatc aaaatatata    3534
tacccgatgg catttacaat aataataaat acaactgaag aaagctataa tatgaaaccg    3594
tgccagaaac ttattcaaag ttttttaatct ctctctctct ctttctaatt tcctttcaaa  3654
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gca ttt att aga ata tcc aga gca cgc ctt gat ggg aca cca gta gtt       145
Ala Phe Ile Arg Ile Ser Arg Ala Arg Leu Asp Gly Thr Pro Val Val
30                  35                  40                  45

att tct aca gca gga cat gac ttg act tgt gca caa tat tgt aga aat      193
Ile Ser Thr Ala Gly His Asp Leu Thr Cys Ala Gln Tyr Cys Arg Asn
            50                  55                  60

aat att gaa cca aca act ggt gct caa cgt gtc tgt gca tca ttt aat      241
Asn Ile Glu Pro Thr Thr Gly Ala Gln Arg Val Cys Ala Ser Phe Asn
                65                  70                  75

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Phe Asp Gly Arg Glu Thr Cys Tyr Phe Phe Asp Asp Ala Ala Ser Pro
            80                  85                  90

gct ggg act ggg gag ttg aat gaa gca cca tca gct aat aat ttt tat      337
Ala Gly Thr Gly Glu Leu Asn Glu Ala Pro Ser Ala Asn Asn Phe Tyr
        95                  100                 105

tat gaa aaa gtt tgc ctt cca gct atc tct gct cat gaa gca tgt act      385
Tyr Glu Lys Val Cys Leu Pro Ala Ile Ser Ala His Glu Ala Cys Thr
110                 115                 120                 125

tat aga tca ttt tca ttt gaa aga act aga aat act caa tta gaa ggt      433
Tyr Arg Ser Phe Ser Phe Glu Arg Thr Arg Asn Thr Gln Leu Glu Gly
            130                 135                 140

ttt gtt aaa aaa tca cta caa gtt aca tca cgt gaa gaa tgc ctt tct      481
Phe Val Lys Lys Ser Leu Gln Val Thr Ser Arg Glu Glu Cys Leu Ser
            145                 150                 155

aca tgt tta aaa gaa agt gaa ttt gta tgt aga tca gtt aac tat aat      529
Thr Cys Leu Lys Glu Ser Glu Phe Val Cys Arg Ser Val Asn Tyr Asn
        160                 165                 170

tat gaa aac ttt atg tgt gaa ctt tca aca gaa aga tcg cgt tct aaa      577
Tyr Glu Asn Phe Met Cys Glu Leu Ser Thr Glu Arg Ser Arg Ser Lys
        175                 180                 185

cca caa aat atg aga atg tca gca gct cca gtt gat tat tat gat aat      625
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190                 195                 200                 205

aat tgt tta aat aga caa aat aga tgt ggt gaa tct ggt gga aat ttg      673
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tca tta aac acc ttc tgt aga tct gtt gaa tat tct cca tct gaa aaa        817
Ser Leu Asn Thr Phe Cys Arg Ser Val Glu Tyr Ser Pro Ser Glu Lys
        255              260              265

aat tgt att gtt tct gat gaa gat aca tat tca aga gct gat caa caa        865
Asn Cys Ile Val Ser Asp Glu Asp Thr Tyr Ser Arg Ala Asp Gln Gln
270              275              280              285

ggt gaa gtt aat aat aaa gat tat tat gaa cct gtt tgt gtt gct gct        913
Gly Glu Val Asn Asn Lys Asp Tyr Tyr Glu Pro Val Cys Val Ala Ala
                290              295              300

gat ctt agt tca tct aca tgt cgt caa caa gct gct ttt gaa aga ttt        961
Asp Leu Ser Ser Ser Thr Cys Arg Gln Gln Ala Ala Phe Glu Arg Phe
            305              310              315

att ggt tct gct att gaa ggt acc cca gtt gct aca gca caa caa gta       1009
Ile Gly Ser Ala Ile Glu Gly Thr Pro Val Ala Thr Ala Gln Gln Val
            320              325              330

acc att tct gat tgt att tca ctt tgt ttc caa aat ttg aat tgt aaa       1057
Thr Ile Ser Asp Cys Ile Ser Leu Cys Phe Gln Asn Leu Asn Cys Lys
        335              340              345

tca att aat tat gat cgt aca caa tct aca tgt tat att tat gct gtt       1105
Ser Ile Asn Tyr Asp Arg Thr Gln Ser Thr Cys Tyr Ile Tyr Ala Val
350              355              360              365

gga aga caa gaa tct aat gtt aaa aat gat gca agt ttc gat tat tat       1153
Gly Arg Gln Glu Ser Asn Val Lys Asn Asp Ala Ser Phe Asp Tyr Tyr
                370              375              380

gaa ttt aca att att gat aat gga tgc cca aga tat cct gct ctt gta       1201
Glu Phe Thr Ile Ile Asp Asn Gly Cys Pro Arg Tyr Pro Ala Leu Val
            385              390              395

ggg cca gtt tta caa gat ttc gac aaa aat cgt ctt aaa tct gaa atg       1249
Gly Pro Val Leu Gln Asp Phe Asp Lys Asn Arg Leu Lys Ser Glu Met
        400              405              410

aaa gca ttc cgt tta gat gga tca tat gat att caa att gaa tgt tct       1297
Lys Ala Phe Arg Leu Asp Gly Ser Tyr Asp Ile Gln Ile Glu Cys Ser
        415              420              425

gtt atg ttt tgt gct ggt cca atg ggt tgt cca cca tct aat tgc ctt       1345
Val Met Phe Cys Ala Gly Pro Met Gly Cys Pro Pro Ser Asn Cys Leu
430              435              440              445

gat tca gga aca aat gaa tta ttt gct tca cat gga aga aag aaa aga       1393
Asp Ser Gly Thr Asn Glu Leu Phe Ala Ser His Gly Arg Lys Lys Arg
            450              455              460
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agt att gtt gat ttc aaa aat aca aca aca tct gca gaa aca tta tct    1441
Ser Ile Val Asp Phe Lys Asn Thr Thr Thr Ser Ala Glu Thr Leu Ser
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gct ata att aga gta ctt gct gct gga gaa gaa gaa tta gaa gtt gaa    1489
Ala Ile Ile Arg Val Leu Ala Ala Gly Glu Glu Glu Leu Glu Val Glu
            480                 485                 490

gaa ttt tat aga aat gat act aat ttt aaa tat gat tct gaa gaa aat    1537
Glu Phe Tyr Arg Asn Asp Thr Asn Phe Lys Tyr Asp Ser Glu Glu Asn
            495                 500                 505

atc tca gct cat aac tta tac tgt atg tct gaa atg tgg ttt gta tca    1585
Ile Ser Ala His Asn Leu Tyr Cys Met Ser Glu Met Trp Phe Val Ser
510                 515                 520                 525

gga att gtt tca atg gct atg atc tgt ctt ctt ctt tct gtt ctt ata    1633
Gly Ile Val Ser Met Ala Met Ile Cys Leu Leu Leu Ser Val Leu Ile
                530                 535                 540

gtt atg tgg ggc tgt cat tca tta aat caa tct tca aaa tta cca atg    1681
Val Met Trp Gly Cys His Ser Leu Asn Gln Ser Ser Lys Leu Pro Met
            545                 550                 555

tgaaggaaga tctttcaaca aaaaaaacg attaattttt aatatttctt taatatatac    1741
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aatctcttcc tatattttga tgtcgtacac acgtttataa aaacaaattc ttttggtttt    1921
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Asn Lys Asp Thr Ser Pro Val Phe Thr Leu Gln His Asn Ser Thr Asn
            35                  40                  45
Gly Ile Leu Ala Arg Ser Leu Pro Gln Pro Gly Leu Ile Asp Cys Ser
        50                  55                  60
Glu His Cys Ser Ser Ser Ser Asp Cys Ile Gly Val Glu Tyr Trp Gln
65                  70                  75                  80
Gly Ile Cys Arg Val Ile Ser Gln Asp Lys Thr Ser Ile Tyr Thr Pro
                85                  90                  95
Thr Asp Glu Thr Ser Ile Leu Leu Thr Lys Ser Cys Val Lys Ser Asp
            100                 105                 110
Arg Ile Cys Ser Ser Pro Phe His Phe Asp Val Tyr Glu Gln Lys Ile
            115                 120                 125
Leu Val Gly Phe Ala Arg Glu Val Val Pro Ala Glu Ser Ile Glu Ile
            130                 135                 140
Cys Met Ala Ala Cys Leu Asn Ala Phe Asp Thr Tyr Gly Phe Glu Cys
145                 150                 155                 160
Glu Ser Ala Met Tyr Tyr Pro Val Asp Ser Glu Cys Ile Leu Asn Thr
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                     165                     170                     175
Glu Asp Arg Leu Asp Arg Pro Asp Leu Phe Val Val Glu Lys Glu Asp
            180                     185                 190
Val Val Tyr Tyr Leu Asp Ser Asn Cys Ala Gly Ser Gln Cys Tyr Ala
        195                 200                 205
Pro Tyr Ile Thr Gln Tyr Ile Ala Val Glu Asn Lys Gln Ile Glu Asn
    210                 215                 220
Glu Leu Asp Arg Lys Phe Glu Asn Ile Asp Phe Gln Thr Cys Glu Glu
225                 230                 235                 240
Leu Cys Thr Gly Arg Ile Thr Val Thr Gln Asn Asp Phe Thr Cys Lys
                245                 250                 255
Ser Phe Met Tyr Asn Pro Glu Thr Lys Val Cys Tyr Leu Ser Asp Glu
            260                 265                 270
Arg Ser Lys Pro Leu Gly Arg Ala Lys Leu Ser Asp Ala Asn Gly Phe
        275                 280                 285
Thr Tyr Tyr Glu Lys Lys Cys Phe Ala Ser Pro Arg Thr Cys Arg Gln
    290                 295                 300
Thr Pro Ser Phe Asn Arg Val Pro Gln Met Ile Leu Val Gly Phe Ala
305                 310                 315                 320
Ala Phe Val Met Glu Asn Val Pro Ser Val Thr Met Cys Leu Asp Gln
                325                 330                 335
Cys Thr Asn Pro Pro Pro Glu Thr Gly Glu Lys Phe Val Cys Lys Ser
            340                 345                 350
Val Met Tyr Tyr Tyr Asn Glu Gln Glu Cys Ile Leu Asn Ala Glu Thr
        355                 360                 365
Arg His Thr Lys Pro Asp Leu Phe Ile Thr Glu Gly Asp Glu Phe Leu
    370                 375                 380
Val Asp Tyr Phe Asp Ile Ser Cys His Leu Glu Pro Glu Thr Cys Pro
385                 390                 395                 400
Lys Gly Thr Tyr Leu Lys Gly Ile Lys Ser Ile Asn Ser Ala Leu Pro
                405                 410                 415
Glu Gly Glu Gly Ser Leu His Val Ile Glu Ser Ala Gly Lys Ser Leu
            420                 425                 430
Glu Glu Cys Met Glu Lys Cys Asn Gln Leu His Pro Glu Lys Cys Arg
        435                 440                 445
Ser Phe Asn Phe Glu Lys Ser Ser Gly Leu Cys Asn Leu Leu Tyr Leu
    450                 455                 460
Asp Gly Lys Asn Thr Leu Lys Pro Phe Ile Lys Asn Gly Phe Asp Leu
465                 470                 475                 480
Val Asp Leu Gln Cys Leu Ser Thr Lys Lys Asp Cys Ser Thr Lys Lys
                485                 490                 495
Asn Asp Ile Asn Phe Val Lys Tyr Leu Tyr Ser His Phe Val Lys Tyr
            500                 505                 510
Leu Tyr Ser Gln Gln Pro Gly Ile Pro Thr Lys Thr Glu Lys Val Ile
        515                 520                 525
Gly Ile Ser Lys Cys Leu Asp Leu Cys Thr Asp Ser Glu Arg Cys Glu
    530                 535                 540
Gly Leu Asn Tyr Asn Arg Arg Thr Gly Glu Cys Gln Leu Phe Glu Ile
545                 550                 555                 560
Ile Asp Gly Pro Ser Asn Leu Lys Lys Ser Glu His Ile Asp Phe Tyr
                565                 570                 575
Gln Asn Leu Cys Ser Thr Lys Glu Asn Glu Ala Gly Val Ser Ser Ala
            580                 585                 590
Leu Asn Val Pro Gln Ser Ser Val Ile Pro Ile Ser Ser Ser Gln Asn
        595                 600                 605
Ile Ser Lys Ser Asp Val Phe Ala Lys Lys Asn Leu Asn Lys Asp Gly
    610                 615                 620
```

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Asn Asn Gln Val Asn Ile Tyr Glu Pro Glu Lys Lys Tyr His Pro Lys
625             630             635                 640
Gly Ser Lys Asn Glu Thr Ser Tyr Glu Thr Gly Thr Val Asn Lys Ser
            645             650                 655
Asn Val Glu Glu Val Ser Glu Thr Leu Thr Asn Ser Gly Val Glu Ser
            660             665                 670
Gly Ser Leu Glu Lys Asn Ile Ile Thr Ala Pro Pro Ser Ile Pro Lys
            675             680             685
Ile Pro Glu Gly Pro Leu Pro Val Pro Ile Leu Ile Pro Ala Asp Gln
            690             695             700
Val Gln Thr Ile Cys Asp Tyr Glu Gly Ile Lys Val Gln Ile Lys Ser
705             710             715                 720
Pro Gln Ser Phe Thr Gly Val Ile Phe Val Lys Asn His Tyr Glu Thr
                725             730             735
Cys Arg Val Glu Val Ser Asn Ser Asp Ala Ala Thr Leu Glu Leu Gly
            740             745             750
Leu Pro Ala Ser Phe Gly Met Lys Pro Val Thr Leu Ser Ala Thr Ser
            755             760             765
Ser Asp Ser Thr Ser Ser Gln Asn Ile Thr Ser Asn Ser Gly His Lys
            770             775             780
Val Val Gly Arg Ala Arg Arg Asp Thr Gln Glu Lys Ser Cys Gly Leu
785             790             795                 800
Thr Glu Ile Glu Asn Gly Lys Tyr Lys Ser Thr Val Val Ile Gln Thr
                805             810             815
Asn Asn Leu Gly Ile Pro Gly Leu Val Thr Ser Thr Asp Gln Ile Tyr
            820             825             830
Glu Ile Gly Cys Asp Tyr Ser Ser Met Leu Gly Gly Lys Ile Thr Thr
            835             840             845
Ala Ala Asn Met Thr Val Asn Gly Pro Thr Pro Thr Asp Ile Lys Pro
            850             855             860
Arg Gly Lys Ile Glu Leu Gly Asn Pro Val Leu Met Gln Met Asn Ala
865             870             875                 880
Gly Thr Gly Asp His Gln Pro Ile Leu Gln Ala Lys Leu Gly Asp Ile
                885             890             895
Leu Glu Leu Arg Trp Glu Ile Met Ala Met Asp Glu Glu Leu Asp Phe
            900             905             910
Phe Val Lys Asp Cys His Ala Glu Pro Gly Thr Gly Ala Gly Gly Asp
            915             920             925
Glu Lys Leu Gln Leu Ile Glu Gly Gly Cys Pro Thr Pro Ala Val Ala
            930             935             940
Gln Lys Leu Ile Pro Gln Pro Ile Lys Leu Gln Ser Ser Ala Val Lys
945             950             955                 960
Ile Ala His Leu Gln Ala Phe Arg Phe Asp Ser Ser Ser Ser Val Arg
            965             970             975
Ile Thr Cys Asn Ile Glu Ile Cys Lys Gly Asp Cys Lys Pro Ala Thr
            980             985             990
Cys Asp Met His Gly Glu Ser Lys Gln Ser Trp Gly Arg Lys Lys Arg
            995             1000            1005
His Ile Glu Asp Asp Thr Ile Thr Glu Phe Glu Thr Asn Arg Tyr Lys
    1010            1015            1020
Val Pro Arg Phe Ser Gln Ala Thr Thr Ser Leu Leu Ile Leu Asp Pro
1025            1030            1035                1040
Leu Gln Asn Asn Ile Glu Pro Ala Ser Leu Met Ser Lys Val Ser Ser
                1045            1050            1055
Leu Asp Leu Leu Ala Glu Asp Pro Ala Lys Thr Leu Leu Lys Ile Lys
            1060            1065            1070
Glu Thr Ala His Leu Asn Gly Asn Leu Cys Met Gly Lys Ile Thr Leu
```

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          1075                  1080                  1085
Phe Ser Val Phe Gly Val Leu Leu Ser Leu Ile Val Val Gln Ala Ile
    1090                  1095                  1100
Val Val Thr Asn Tyr Ile Phe Lys Arg Val Met Ser Ser Arg Lys Ile
1105                  1110                  1115                  1120
Thr Asn
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<210> 4
<211> 557
<212> PRT
<213> Strongyloides stercoralis

<400> 4
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Met Asn Trp Leu Ser Ile Ala Ser Ile Cys Thr Phe Leu Ile Ile Pro
 1               5                  10                  15
Ile Ser Ala Val Phe Glu Cys Ser Gly Ser Glu Thr Thr Ala Phe Ile
            20                  25                  30
Arg Ile Ser Arg Ala Arg Leu Asp Gly Thr Pro Val Val Ile Ser Thr
        35                  40                  45
Ala Gly His Asp Leu Thr Cys Ala Gln Tyr Cys Arg Asn Asn Ile Glu
    50                  55                  60
Pro Thr Thr Gly Ala Gln Arg Val Cys Ala Ser Phe Asn Phe Asp Gly
65                  70                  75                  80
Arg Glu Thr Cys Tyr Phe Phe Asp Asp Ala Ala Ser Pro Ala Gly Thr
                85                  90                  95
Gly Glu Leu Asn Glu Ala Pro Ser Ala Asn Asn Phe Tyr Tyr Glu Lys
            100                 105                 110
Val Cys Leu Pro Ala Ile Ser Ala His Glu Ala Cys Thr Tyr Arg Ser
        115                 120                 125
Phe Ser Phe Glu Arg Thr Arg Asn Thr Gln Leu Glu Gly Phe Val Lys
    130                 135                 140
Lys Ser Leu Gln Val Thr Ser Arg Glu Glu Cys Leu Ser Thr Cys Leu
145                 150                 155                 160
Lys Glu Ser Glu Phe Val Cys Arg Ser Val Asn Tyr Asn Tyr Glu Asn
                165                 170                 175
Phe Met Cys Glu Leu Ser Thr Glu Arg Ser Arg Ser Lys Pro Gln Asn
            180                 185                 190
Met Arg Met Ser Ala Ala Pro Val Asp Tyr Tyr Asp Asn Asn Cys Leu
        195                 200                 205
Asn Arg Gln Asn Arg Cys Gly Glu Ser Gly Gly Asn Leu Ile Phe Ile
    210                 215                 220
Lys Thr Thr Gln Phe Glu Ile His Tyr Tyr Asp His Thr Gln Ser Met
225                 230                 235                 240
Glu Ala Gln Glu Ser Phe Cys Leu Gln Lys Cys Leu Asp Ser Leu Asn
                245                 250                 255
Thr Phe Cys Arg Ser Val Glu Tyr Ser Pro Ser Glu Lys Asn Cys Ile
            260                 265                 270
Val Ser Asp Glu Asp Thr Tyr Ser Arg Ala Asp Gln Gln Gly Glu Val
        275                 280                 285
Asn Asn Lys Asp Tyr Tyr Glu Pro Val Cys Val Ala Ala Asp Leu Ser
    290                 295                 300
Ser Ser Thr Cys Arg Gln Gln Ala Ala Phe Glu Arg Phe Ile Gly Ser
305                 310                 315                 320
Ala Ile Glu Gly Thr Pro Val Ala Thr Ala Gln Gln Val Thr Ile Ser
            325                 330                 335
Asp Cys Ile Ser Leu Cys Phe Gln Asn Leu Asn Cys Lys Ser Ile Asn
```

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                    340                        345                        350
Tyr Asp Arg Thr Gln Ser Thr Cys Tyr Ile Tyr Ala Val Gly Arg Gln
           355                        360                        365
Glu Ser Asn Val Lys Asn Asp Ala Ser Phe Asp Tyr Tyr Glu Phe Thr
        370                        375                        380
Ile Ile Asp Asn Gly Cys Pro Arg Tyr Pro Ala Leu Val Gly Pro Val
385                        390                        395                        400
Leu Gln Asp Phe Asp Lys Asn Arg Leu Lys Ser Glu Met Lys Ala Phe
                405                        410                        415
Arg Leu Asp Gly Ser Tyr Asp Ile Gln Ile Glu Cys Ser Val Met Phe
                420                        425                        430
Cys Ala Gly Pro Met Gly Cys Pro Pro Ser Asn Cys Leu Asp Ser Gly
           435                        440                        445
Thr Asn Glu Leu Phe Ala Ser His Gly Arg Lys Lys Arg Ser Ile Val
        450                        455                        460
Asp Phe Lys Asn Thr Thr Thr Ser Ala Glu Thr Leu Ser Ala Ile Ile
465                        470                        475                        480
Arg Val Leu Ala Ala Gly Glu Glu Glu Leu Glu Val Glu Glu Phe Tyr
                485                        490                        495
Arg Asn Asp Thr Asn Phe Lys Tyr Asp Ser Glu Glu Asn Ile Ser Ala
                500                        505                        510
His Asn Leu Tyr Cys Met Ser Glu Met Trp Phe Val Ser Gly Ile Val
           515                        520                        525
Ser Met Ala Met Ile Cys Leu Leu Leu Ser Val Leu Ile Val Met Trp
        530                        535                        540
Gly Cys His Ser Leu Asn Gln Ser Ser Lys Leu Pro Met
545                        550                        555
```

<210> 5
<211> 3369
<212> DNA
<213> Strongyloides stercoralis

<400> 5
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atgtctaagt ctgggcttca tcttgtagcc tacatattat tgatattttt aatttcaact      60
aatatagcat ctaaaatttc tggtgttcca ttatgcaaca aagatacttc accagtattt     120
acacttcaac ataattctac taatggtatt ttagctagat ctcttccaca accaggatta     180
attgattgtt cagaacattg ttcctcttcg tcagattgta ttggcgttga atattggcag     240
ggaatttgta gagttatttc tcaagataaa acttctattt atacaccaac agatgaaact     300
tcaatacttt taacaaaatc atgtgttaaa agtgatcgta tatgttcatc accattccat     360
tttgatgttt atgaacaaaa aatattagtt ggatttgcta gagaagttgt accagctgag     420
tctattgaaa tttgtatggc tgcttgtttg aatgcttttg atacatatgg ttttgaatgt     480
gaatcagcta tgtattatcc agttgatagt gaatgtattc ttaatactga agatagactt     540
gatcgaccag atcttttttgt tgttgaaaaa gaagatgttg tttattatct tgattctaat     600
tgtgctggtt cacaatgtta tgctccatac attacacaat atattgctgt tgaaaataaa     660
caaatagaaa atgaattaga tagaaaattt gaaatattg atttccaaac atgtgaagaa     720
ttatgtactg gtagaattac tgttacacaa aatgatttta cttgtaaatc atttatgtat     780
aatcctgaaa caaaagtttg ttatctttct gatgaacgtt caaagcctct tggacgggct     840
aaattaagtg atgctaatgg atttacttat tatgaaaaaa aatgtttttgc atctccaaga     900
acatgccgtc aaacaccatc atttaataga gtaccacaaa tgattcttgt tggttttgct     960
gcatttgtta tggaaaatgt accatctgtt actatgtgcc ttgatcaatg tacaaatcca    1020
ccaccagaga caggtgaaaa atttgtctgt aaatctgtta tgtactatta taatgaacaa    1080
gaatgtattc ttaatgctga aacaagacat acaaagccag atcttttttat tacagaagga    1140
gatgaatttc ttgttgatta ttttgatatt tcatgtcatc ttgaaccaga aacatgtcct    1200
aaaggaacat atttaaaagg aattaaatct atcaattctg cacttcctga gggtgaaggc    1260
tcacttcatg ttattgagtc tgctggaaaa tcattagaag aatgtatgga aaaatgtaac    1320
caacttcatc cagaaaaatg tagatcattt aattttgaaa aatcatctgg attatgtaat    1380
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cttttatatc ttgatggaaa aaatacttta aaaccattta ttaaaaatgg atttgatctt    1440
gttgatttac aatgtttatc aactaaaaaa gattgctcta caaaaaagaa tgatattaat    1500
tttgttaaat atctttactc tcattttgtt aaatatcttt actctcaaca acctggaatt    1560
ccaacaaaaa cagaaaaagt tattggtatt tctaaatgtc ttgatttatg tactgatagt    1620
gaacgttgtg aaggacttaa ttataataga agaactggag aatgtcaatt atttgaaatt    1680
attgatggac cttctaatct taaaaaatct gagcatatag attttttatca aaatctttgt    1740
tctactaaag aaaatgaagc tggtgtttca tctgcattaa atgtaccaca atcatctgtt    1800
attcctattt catcatcaca aaatattagt aaaagtgatg tttttgccaa aaaaaatctt    1860
aataaagatg gtaataatca agtaaacatt tatgaaccag aaaaaaaata ccatccaaaa    1920
ggatcaaaaa atgaaacatc atatgaaaca ggaactgtaa ataaatcaaa tgttgaagag    1980
gtttctgaaa ctttaactaa tagtggagtt gaaagtggaa gtcttgaaaa aaatattatt    2040
acagcaccac catctatacc aaaaattcct gaaggtccac taccagtgcc aattttaatt    2100
ccagctgatc aagtacaaac tatttgtgat tatgaaggta ttaaagtaca aattaaatca    2160
ccacaatcat ttactggtgt tatctttgtt aaaaatcact atgaaacatg tcgtgttgaa    2220
gtttccaact ctgatgcagc tactcttgag cttggtcttc cagcttcatt tggaatgaaa    2280
ccagttacac tgtctgctac atcttcagat tctacctctt cacagaatat tacttctaat    2340
agtggacata aagttgttgg aagagcacgc cgtgatacac aagaaaaatc ttgtggtctt    2400
acagaaattg aaaatggaaa atataaaagt actgttgtta tacaaacaaa taaccttgga    2460
attcctggac ttgtaacatc aacagatcaa atttatgaaa ttggttgtga ttatagtagt    2520
atgttaggag gaaaaaattac tacagcagct aatatgactg taaatggacc aacaccaact    2580
gatattaaac ctagaggtaa aattgaactt ggaaatcctg ttcttatgca aatgaatgct    2640
ggtacaggtg atcatcagcc aattttacaa gctaaacttg gagatattct tgaattaaga    2700
tgggaaatta tggctatgga tgaagaactt gatttctttg ttaaagattg tcatgcagaa    2760
cctggtactg gtgctggagg agatgaaaaa cttcagctta ttgaaggtgg atgcccaaca    2820
ccagctgttg ctcaaaaact tattccacaa ccaataaaat tacaatcatc agctgtcaaa    2880
attgcccatc ttcaagcttt ccgtttttgat tcatcctctt cagttagaat aacatgtaat    2940
attgaaattt gtaagggaga ttgtaaacca gcaacatgtg atatgcacgg agaatcaaaa    3000
caatcatggg gaagaaaaaa gagacatatt gaagatgata caattacaga atttgagaca    3060
aatcgttata aagttccaag attttcacaa gcaacaacat ctcttttaat tcttgatcca    3120
cttcaaaata acattgaacc agcatcatta atgtcaaaag tatcatctct tgatttgtta    3180
gctgaagatc ctgcaaaaac attacttaag attaaagaga ctgcacattt gaatggaaat    3240
ctttgtatgg gaaaaattac acttttctca gtatttggtg ttcttctttc attaattgtt    3300
gttcaagcaa ttgtcgtaac aaattatatt tttaaaagag ttatgtcaag cagaaagatt    3360
accaattaa                                                             3369
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<210> 6
<211> 1674
<212> DNA
<213> Strongyloides stercoralis

<400> 6
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atgaactggc tatctatagc ttcaatttgt acattcttaa ttataccaat atctgctgtc     60
tttgaatgtt caggatcaga aactacagca tttattagaa tatccagagc acgccttgat    120
gggacaccag tagttatttc tacagcagga catgacttga cttgtgcaca atattgtaga    180
aataatattg aaccaacaac tggtgctcaa cgtgtctgtg catcatttaa ttttgatggt    240
cgtgaaacat gctacttttt tgatgatgct gcctcacctg ctgggactgg ggagttgaat    300
gaagcaccat cagctaataa ttttttattat gaaaaagttt gccttccagc tatctctgct    360
catgaagcat gtacttatag atcattttca tttgaaagaa ctagaaatac tcaattagaa    420
ggttttgtta aaaaatcact acaagttaca tcacgtgaag aatgcctttc tacatgttta    480
aaagaaagtg aatttgtatg tagatcagtt aactataatt atgaaaactt tatgtgtgaa    540
ctttcaacag aaagatcgcg ttctaaacca caaaatatga aatgtcagc agctccagtt    600
gattattatg ataataattg tttaaataga caaaatagat gtggtgaatc tggtggaaat    660
ttgattttta ttaaaacaac acaatttgaa attcattatt atgatcatac tcaatcaatg    720
gaagcacaag aatcattctg tttacaaaaa tgtttagatt cattaaacac cttctgtaga    780
tctgttgaat attctccatc tgaaaaaaat tgtattgttt ctgatgaaga tacatattca    840
agagctgatc aacaaggtga agttaataat aaagattatt atgaacctgt ttgtgttgct    900
gctgatctta gttcatctac atgtcgtcaa caagctgctt ttgaaagatt tattggttct    960
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gctattgaag gtaccccagt tgctacagca caacaagtaa ccatttctga ttgtatttca      1020
ctttgtttcc aaaatttgaa ttgtaaatca attaattatg atcgtacaca atctacatgt      1080
tatatttatg ctgttggaag acaagaatct aatgttaaaa atgatgcaag tttcgattat      1140
tatgaattta caattattga taatggatgc ccaagatatc ctgctcttgt agggccagtt      1200
ttacaagatt tcgacaaaaa tcgtcttaaa tctgaaatga aagcattccg tttagatgga      1260
tcatatgata ttcaaattga atgttctgtt atgttttgtg ctggtccaat gggttgtcca      1320
ccatctaatt gccttgattc aggaacaaat gaattatttg cttcacatgg aagaaagaaa      1380
agaagtattg ttgatttcaa aaatacaaca acatctgcag aaacattatc tgctataatt      1440
agagtacttg ctgctggaga agaagaatta gaagttgaag aattttatag aaatgatact      1500
aattttaaat atgattctga agaaaatatc tcagctcata acttatactg tatgtctgaa      1560
atgtggtttg tatcaggaat tgtttcaatg gctatgatct gtcttcttct ttctgttctt      1620
atagttatgt ggggctgtca ttcattaaat caatcttcaa aattaccaat gtga           1674
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<210> 7
<211> 3847
<212> DNA
<213> Meloidogyne javanica

<220>
<221> CDS
<222> (181)...(3810)

<400> 7
gcgtcgatag tccgattttt taaggtttaa ttacccaagc ttaaggaata tttgaagctt       60
attttaaag aaaaaataaa ttaaataaga gattagcaca acaacaacag aaatttttct      120
tgaatttaca acaaataat tttttcttaa ttaaattcct ttaaattatc cacaacttct      180
atg gtt aca aaa atc cca act ttt ccc ctc ctt ttt att ttc cca ttt      228
Met Val Thr Lys Ile Pro Thr Phe Pro Leu Leu Phe Ile Phe Pro Phe
 1               5                  10                  15

tta ttt aca ttt tta acg aca aaa tgt cag gct tat tct ata cca tta      276
Leu Phe Thr Phe Leu Thr Thr Lys Cys Gln Ala Tyr Ser Ile Pro Leu
            20                  25                  30

ata tca gaa tgt aat tcg gaa gaa gcc cca gtt ttt ctt ttg caa cgg      324
Ile Ser Glu Cys Asn Ser Glu Glu Ala Pro Val Phe Leu Leu Gln Arg
        35                  40                  45

aat gtt tct tct atc gcc gga act gag cct tta aga act gtt cct gtt      372
Asn Val Ser Ser Ile Ala Gly Thr Glu Pro Leu Arg Thr Val Pro Val
    50                  55                  60

aca ggg gga ttt ttg gaa tgt gcg gaa ctt tgt tca gca gca aat aat      420
Thr Gly Gly Phe Leu Glu Cys Ala Glu Leu Cys Ser Ala Ala Asn Asn
65                  70                  75                  80

tgt gtt gct gtt aaa ttt tct att gaa aaa caa tgc caa ttg ttg ggg      468
Cys Val Ala Val Lys Phe Ser Ile Glu Lys Gln Cys Gln Leu Leu Gly
                85                  90                  95

aaa aca act atg aca gca aca act tta tct tta caa gac att aat ttg      516
Lys Thr Thr Met Thr Ala Thr Thr Leu Ser Leu Gln Asp Ile Asn Leu
            100                 105                 110

aca cta gct aga tta gct act aaa agt tgt gtt aag agc aaa aaa atc      564
Thr Leu Ala Arg Leu Ala Thr Lys Ser Cys Val Lys Ser Lys Lys Ile
        115                 120                 125
```

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tgt tct tcc ccc ttc cat ttt gat gtt cac gaa caa aaa ata ctt gtt        612
Cys Ser Ser Pro Phe His Phe Asp Val His Glu Gln Lys Ile Leu Val
    130             135             140

ggt ttt gct aga gaa gtt gta tca gca gaa tct ata cat caa tgt tta        660
Gly Phe Ala Arg Glu Val Val Ser Ala Glu Ser Ile His Gln Cys Leu
145             150             155                 160

act gct tgt tta gat gct gtt gat act ttt ggc ttt gaa tgc gag tca        708
Thr Ala Cys Leu Asp Ala Val Asp Thr Phe Gly Phe Glu Cys Glu Ser
                165             170             175

gta atg tat tat cca ttg gat gcc gaa tgt att tta aat aca gaa gac        756
Val Met Tyr Tyr Pro Leu Asp Ala Glu Cys Ile Leu Asn Thr Glu Asp
            180             185             190

aga ctt gac cgt cca gat ttg ttt gtt gat gag aag gaa gat act gtt        804
Arg Leu Asp Arg Pro Asp Leu Phe Val Asp Glu Lys Glu Asp Thr Val
        195             200             205

gtt tat ttg gat aat aat tgt gct gga tcc caa tgt cat gcc cct tat        852
Val Tyr Leu Asp Asn Asn Cys Ala Gly Ser Gln Cys His Ala Pro Tyr
    210             215             220

gta acc caa tat gta gct gtt gaa gga aaa caa tta gct gag gaa ttg        900
Val Thr Gln Tyr Val Ala Val Glu Gly Lys Gln Leu Ala Glu Glu Leu
225             230             235                 240

gat cat aat ttt gag gga atg gag ttg aca gaa tgt gaa cag ctt tgt        948
Asp His Asn Phe Glu Gly Met Glu Leu Thr Glu Cys Glu Gln Leu Cys
                245             250             255

aat caa aga ttg agt gtt tct gca aat gac ttt aat tgc aaa gca ttt        996
Asn Gln Arg Leu Ser Val Ser Ala Asn Asp Phe Asn Cys Lys Ala Phe
            260             265             270

atg tac aat aac caa aca aga tct tgt att ctt tct gat gaa cgt tca        1044
Met Tyr Asn Asn Gln Thr Arg Ser Cys Ile Leu Ser Asp Glu Arg Ser
        275             280             285

aga cct ttg ggt aga gct aat ttg aca gat gct aaa gga tgg act tat        1092
Arg Pro Leu Gly Arg Ala Asn Leu Thr Asp Ala Lys Gly Trp Thr Tyr
    290             295             300

cac gag aaa aaa tgt ttt gcc tcc cca cgt aca tgc cga aat gtt cct        1140
His Glu Lys Lys Cys Phe Ala Ser Pro Arg Thr Cys Arg Asn Val Pro
305             310             315                 320

tct ttt acc cgc gtc cct caa atg tta tta gtt gga ttt gcc tct ttt        1188
Ser Phe Thr Arg Val Pro Gln Met Leu Leu Val Gly Phe Ala Ser Phe
                325             330             335

gta atg gaa aat gtc cct tca gta act atg tgt ttg gat caa tgt aca        1236
Val Met Glu Asn Val Pro Ser Val Thr Met Cys Leu Asp Gln Cys Thr
                340             345             350
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aat cct ccc cca gaa act gga caa agt ttt gtt tgt aaa tct gtc atg      1284
Asn Pro Pro Pro Glu Thr Gly Gln Ser Phe Val Cys Lys Ser Val Met
        355                 360                 365

tat tat tat aat gag caa gaa tgt att tta aat gct gaa tca cgt cat      1332
Tyr Tyr Tyr Asn Glu Gln Glu Cys Ile Leu Asn Ala Glu Ser Arg His
        370                 375                 380

tcc aag cca gat tta ttt att ccc gaa gaa gac gat ttt gtt gta gat      1380
Ser Lys Pro Asp Leu Phe Ile Pro Glu Glu Asp Asp Phe Val Val Asp
385                 390                 395                 400

tat ttt gat ata aat tgc cgt cta gaa caa gaa caa tgt atc gat gga      1428
Tyr Phe Asp Ile Asn Cys Arg Leu Glu Gln Glu Gln Cys Ile Asp Gly
                405                 410                 415

aga acg ccc caa tta gtt aga aca att aat tct gca ctt cca gaa ggg      1476
Arg Thr Pro Gln Leu Val Arg Thr Ile Asn Ser Ala Leu Pro Glu Gly
                420                 425                 430

gag ggg tct ata cat gtt ttg gaa aca att aag gga gga gtt cag caa      1524
Glu Gly Ser Ile His Val Leu Glu Thr Ile Lys Gly Gly Val Gln Gln
                435                 440                 445

tgt gct aaa aaa tgt tct gaa cgc gcc cca gac aaa tgt cgc tct ttc      1572
Cys Ala Lys Lys Cys Ser Glu Arg Ala Pro Asp Lys Cys Arg Ser Phe
        450                 455                 460

aat ttt gat aaa caa gct ggt aat tgt aat tta ctt tat ttg gat gga      1620
Asn Phe Asp Lys Gln Ala Gly Asn Cys Asn Leu Leu Tyr Leu Asp Gly
465                 470                 475                 480

caa ggg tct tta cga cca gag caa aag aca caa ttc gat tta tac gat      1668
Gln Gly Ser Leu Arg Pro Glu Gln Lys Thr Gln Phe Asp Leu Tyr Asp
                485                 490                 495

gtt cat tgt ttg agt gga aca tct caa ctt tta gga gaa aat tct aaa      1716
Val His Cys Leu Ser Gly Thr Ser Gln Leu Leu Gly Glu Asn Ser Lys
                500                 505                 510

cat tct ccc tct gct tgt gtt gac cca gaa ggg gct att ttt agt cgt      1764
His Ser Pro Ser Ala Cys Val Asp Pro Glu Gly Ala Ile Phe Ser Arg
        515                 520                 525

ttc ctc tac act cgt tgg gta gca aat tct ccc aat cgt gaa att tca      1812
Phe Leu Tyr Thr Arg Trp Val Ala Asn Ser Pro Asn Arg Glu Ile Ser
        530                 535                 540

agt tta cca ctt tcc aaa tgt tta aat ctt tgt tcg gtt gga gga gaa      1860
Ser Leu Pro Leu Ser Lys Cys Leu Asn Leu Cys Ser Val Gly Gly Glu
545                 550                 555                 560

caa tgt gag ggt gtt aat tac aat cgc cga aat ggt tct tgt caa tta      1908
Gln Cys Glu Gly Val Asn Tyr Asn Arg Arg Asn Gly Ser Cys Gln Leu
                565                 570                 575

ttt act tcc ctt cta tta aac tct tct cca aat tct caa caa gac aaa      1956
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```
Phe Thr Ser Leu Leu Leu Asn Ser Ser Pro Asn Ser Gln Gln Asp Lys
        580                 585                 590

gac gaa cat gtt gat ttt tac aga aat att tgt aga gtt aag gaa tcg     2004
Asp Glu His Val Asp Phe Tyr Arg Asn Ile Cys Arg Val Lys Glu Ser
        595                 600                 605

aaa agt gat agt ggg gct gct aat gta ccc aaa aca caa caa gca acg     2052
Lys Ser Asp Ser Gly Ala Ala Asn Val Pro Lys Thr Gln Gln Ala Thr
    610                 615                 620

gct gca cct ccc cct tct gtt caa tta act act aaa cct cca caa att     2100
Ala Ala Pro Pro Pro Ser Val Gln Leu Thr Thr Lys Pro Pro Gln Ile
625                 630                 635                 640

cgt gat tta aac aac aac aat aaa aca aca cac aaa gaa cca aat att     2148
Arg Asp Leu Asn Asn Asn Asn Lys Thr Thr His Lys Glu Pro Asn Ile
                645                 650                 655

aaa ctt cca cca caa tca gca aaa cct ata aat gga aaa act gga aag     2196
Lys Leu Pro Pro Gln Ser Ala Lys Pro Ile Asn Gly Lys Thr Gly Lys
                660                 665                 670

gaa caa ctt cct gta ggg tca aaa tct ttt ggg gtt act aat acg cgt.    2244
Glu Gln Leu Pro Val Gly Ser Lys Ser Phe Gly Val Thr Asn Thr Arg
            675                 680                 685

gat gat ggg gag aat tca ata act gga act gct cct cct cct gta gat     2292
Asp Asp Gly Glu Asn Ser Ile Thr Gly Thr Ala Pro Pro Pro Val Asp
    690                 695                 700

ggc aaa tta att att aaa cct tca cca caa gtt tct att ccc tcc cct     2340
Gly Lys Leu Ile Ile Lys Pro Ser Pro Gln Val Ser Ile Pro Ser Pro
705                 710                 715                 720

gta ctt att ccg gca caa gaa gta cat act att tgt aat tat gaa gga     2388
Val Leu Ile Pro Ala Gln Glu Val His Thr Ile Cys Asn Tyr Glu Gly
                725                 730                 735

att agt gtt caa att aaa cat tct tct cca ttc tct ggc gtt gtt ttt     2436
Ile Ser Val Gln Ile Lys His Ser Ser Pro Phe Ser Gly Val Val Phe
            740                 745                 750

gtt cga aat aaa tat gat act tgc cgt gtg aag ttg aag gaa agg aca     2484
Val Arg Asn Lys Tyr Asp Thr Cys Arg Val Lys Leu Lys Glu Arg Thr
            755                 760                 765

gcg ttg ttt tgg ttt tgg ggc ttc cag caa att ttg gaa atg aag cca     2532
Ala Leu Phe Trp Phe Trp Gly Phe Gln Gln Ile Leu Glu Met Lys Pro
        770                 775                 780

att gct tta att aat tca caa aaa cat gga aaa ggg aat aaa aca cac     2580
Ile Ala Leu Ile Asn Ser Gln Lys His Gly Lys Gly Asn Lys Thr His
785                 790                 795                 800

gga gat act tta ctt tct att gaa ggt tcc aaa aaa caa att gaa ggg     2628
Gly Asp Thr Leu Leu Ser Ile Glu Gly Ser Lys Lys Gln Ile Glu Gly
```

```
                805                        810                        815

ggt tct tca act gaa gat att caa tta ata aat tct caa aaa gac ctt        2676
Gly Ser Ser Thr Glu Asp Ile Gln Leu Ile Asn Ser Gln Lys Asp Leu
            820                 825                 830

aaa cgt tca aga aga caa tta caa aga gat tgt gga tta caa gat atg        2724
Lys Arg Ser Arg Arg Gln Leu Gln Arg Asp Cys Gly Leu Gln Asp Met
            835                 840                 845

gac aat gga act tac aaa act gtt att gtt gtc caa aca aat aat ttg        2772
Asp Asn Gly Thr Tyr Lys Thr Val Ile Val Val Gln Thr Asn Asn Leu
        850                 855                 860

gga att ccg gga ctt gtt act tct atg gac caa ctt tat gag att tcc        2820
Gly Ile Pro Gly Leu Val Thr Ser Met Asp Gln Leu Tyr Glu Ile Ser
865                 870                 875                 880

tgt aac tat tca agt atg ttg gga ggc aaa gtc caa aca gca gct gca        2868
Cys Asn Tyr Ser Ser Met Leu Gly Gly Lys Val Gln Thr Ala Ala Ala
                885                 890                 895

tta cgt gtt cac ggt ccc caa cct tca cta atc cag cct cgc ggc aaa        2916
Leu Arg Val His Gly Pro Gln Pro Ser Leu Ile Gln Pro Arg Gly Lys
            900                 905                 910

ata gaa ttg gga aat cct gtt ttg atg caa atg ggg cct gta cgt agt        2964
Ile Glu Leu Gly Asn Pro Val Leu Met Gln Met Gly Pro Val Arg Ser
            915                 920                 925

gaa agg caa agt ggg gaa ggg cct tta att caa gct aaa ttg ggg gat        3012
Glu Arg Gln Ser Gly Glu Gly Pro Leu Ile Gln Ala Lys Leu Gly Asp
        930                 935                 940

att ctt gaa tta aaa tgg gaa att atg gca atg gat gaa gaa ttg gac        3060
Ile Leu Glu Leu Lys Trp Glu Ile Met Ala Met Asp Glu Glu Leu Asp
945                 950                 955                 960

ttt tta gtt cgt gat tgt ttt gca gag ccg gga act tct gga aat caa        3108
Phe Leu Val Arg Asp Cys Phe Ala Glu Pro Gly Thr Ser Gly Asn Gln
                965                 970                 975

ggg gaa aga ctt cct tta att gag aat ggt tgt cca aca cca gca gta        3156
Gly Glu Arg Leu Pro Leu Ile Glu Asn Gly Cys Pro Thr Pro Ala Val
            980                 985                 990

gca caa aaa tta att cca aat cca ata aaa gca att aat tct gca gtt        3204
Ala Gln Lys Leu Ile Pro Asn Pro Ile Lys Ala Ile Asn Ser Ala Val
            995                 1000                1005

aaa tta act tat tta caa gca ttc aga ttt gac agt tct cca gct att        3252
Lys Leu Thr Tyr Leu Gln Ala Phe Arg Phe Asp Ser Ser Pro Ala Ile
        1010                1015                1020

aga ata act tgt cat tta gaa tta tgt aaa gaa aat tgt aaa tcg gtt        3300
Arg Ile Thr Cys His Leu Glu Leu Cys Lys Glu Asn Cys Lys Ser Val
1025                1030                1035                1040
```

```
aat tgt aaa ttt aat gat gga att aaa gaa tcg tgg ggc aga aaa cgc      3348
Asn Cys Lys Phe Asn Asp Gly Ile Lys Glu Ser Trp Gly Arg Lys Arg
            1045                1050                1055

cgt ttt gct att gac aat aac att aat agg aaa aat gaa gtt aaa gaa      3396
Arg Phe Ala Ile Asp Asn Asn Ile Asn Arg Lys Asn Glu Val Lys Glu
            1060                1065                1070

ttc gaa act cgc cgt ttt gtc gtt ccc cgt ttt gcc caa gca aca act      3444
Phe Glu Thr Arg Arg Phe Val Val Pro Arg Phe Ala Gln Ala Thr Thr
            1075                1080                1085

tct tta gtt att gta gac cct tta caa caa caa aat tct gtt ata aaa      3492
Ser Leu Val Ile Val Asp Pro Leu Gln Gln Gln Asn Ser Val Ile Lys
         1090                1095                1100

aca gaa caa caa caa caa cca ttt att tca cat tcc tca ata tct aaa      3540
Thr Glu Gln Gln Gln Gln Pro Phe Ile Ser His Ser Ser Ile Ser Lys
1105                1110                1115                1120

caa ata ttt gaa aat aat aaa aaa gaa aat aat aaa aat ata aca aaa      3588
Gln Ile Phe Glu Asn Asn Lys Lys Glu Asn Asn Lys Asn Ile Thr Lys
                  1125                1130                1135

aca gct aaa aaa tcc tct tct ctt ttt gaa gct ttt act gag gct gct      3636
Thr Ala Lys Lys Ser Ser Ser Leu Phe Glu Ala Phe Thr Glu Ala Ala
            1140                1145                1150

ggt gga agg aaa att aat tta gaa tta aca aca aca aat tca gaa caa      3684
Gly Gly Arg Lys Ile Asn Leu Glu Leu Thr Thr Thr Asn Ser Glu Gln
         1155                1160                1165

caa caa ctt tgt tta cat aaa tgg aca ctt ggg ggt gtt ttt gga act      3732
Gln Gln Leu Cys Leu His Lys Trp Thr Leu Gly Gly Val Phe Gly Thr
         1170                1175                1180

ctt tta aca tta att gtt gtt caa agc ggg gtt gct gct aaa cat tta      3780
Leu Leu Thr Leu Ile Val Val Gln Ser Gly Val Ala Ala Lys His Leu
1185                1190                1195                1200

att aat cga ttt att gtt gga aaa aga att taaaaaaaaa aaaaaaagta        3830
Ile Asn Arg Phe Ile Val Gly Lys Arg Ile
                  1205                1210

ctagtcgacg cgtggcc                                                   3847
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<210> 8
<211> 752
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<213> Heterodera glycines

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<222> (1)...(750)

<400> 8
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Glu Gln Lys Ile Leu Val Gly Phe Ala Arg Glu Val Val Ser Ala Asp
 1               5                  10                  15

tca gtc cac cgc tgt ctg tcc gct tgt ctg aat gcg ttc gat acg ttc        96
Ser Val His Arg Cys Leu Ser Ala Cys Leu Asn Ala Phe Asp Thr Phe
                20                  25                  30

ggc ttc gaa tgc gag tcg gtc atg tat tac cct gtg gac gcg gaa tgc       144
Gly Phe Glu Cys Glu Ser Val Met Tyr Tyr Pro Val Asp Ala Glu Cys
                35                  40                  45

att ttg aac acg gag gac cga ttg gat cgg cct gac ctt ttc gtg gac       192
Ile Leu Asn Thr Glu Asp Arg Leu Asp Arg Pro Asp Leu Phe Val Asp
        50                  55                  60

gag cac gag gac acg gtc atc tac ttg gac aac aat tgc gcc gga tgt       240
Glu His Glu Asp Thr Val Ile Tyr Leu Asp Asn Asn Cys Ala Gly Cys
 65                  70                  75                  80

gag tgc cat tgg cat ttt gac aat ttc aaa aca agc ggc att ttg aac       288
Glu Cys His Trp His Phe Asp Asn Phe Lys Thr Ser Gly Ile Leu Asn
                85                  90                  95

gac caa caa ttc gca att gca gca caa tgt tac gca ccg tac gta acg       336
Asp Gln Gln Phe Ala Ile Ala Ala Gln Cys Tyr Ala Pro Tyr Val Thr
                100                 105                 110

caa tac gtg gcg gtg gaa gga cgc caa ttg tcg gac gaa ttg gac cac       384
Gln Tyr Val Ala Val Glu Gly Arg Gln Leu Ser Asp Glu Leu Asp His
                115                 120                 125

agt ttt gaa ggg ttg gag ctg agc gaa tgt gaa gag ttg tgc acg caa       432
Ser Phe Glu Gly Leu Glu Leu Ser Glu Cys Glu Glu Leu Cys Thr Gln
        130                 135                 140

cgg tta agt gtt acg gca aac gac ttc aac tgc aaa tcg ttc atg tac       480
Arg Leu Ser Val Thr Ala Asn Asp Phe Asn Cys Lys Ser Phe Met Tyr
145                 150                 155                 160

agt aac ttg acg cgc agt tgc gtt ttg tcg gac gaa cgc tcg cgc cct       528
Ser Asn Leu Thr Arg Ser Cys Val Leu Ser Asp Glu Arg Ser Arg Pro
                165                 170                 175

ttg ggc cgt gcc aat ttg gcc gaa gtg ccg gga tgg act tat ttc gag       576
Leu Gly Arg Ala Asn Leu Ala Glu Val Pro Gly Trp Thr Tyr Phe Glu
                180                 185                 190

agc cgc ggc gtt ccg tcg ttt acg cga gtg ccg caa atg ctt ttg gtg       624
Ser Arg Gly Val Pro Ser Phe Thr Arg Val Pro Gln Met Leu Leu Val
                195                 200                 205

ggc ttt gcc tct ttt gtg atg gaa aat gtg ccg tca gtg aca atg tgt       672
Gly Phe Ala Ser Phe Val Met Glu Asn Val Pro Ser Val Thr Met Cys
                210                 215                 220

ttg gac caa tgc aca agc cct cct cct gag acg gga caa aac ttt gtg       720
```

```
Leu Asp Gln Cys Thr Ser Pro Pro Pro Glu Thr Gly Gln Asn Phe Val
225             230             235             240


tgt aaa tcg gtg atg tac tac tac aac gag ca                          752
Cys Lys Ser Val Met Tyr Tyr Tyr Asn Glu
                245             250
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<210> 9
<211> 2808
<212> DNA
<213> Brugia malayi

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<222> (166)...(2808)

<400> 9

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tcttatcaga ctgtcccatt catcatcgtg accactacca gtattacttc aggacagtaa   120
tattcgggta aatttcggct gctcaatcgg taggaccgct ttaat atg cat ctt tcc   177
                                                   Met His Leu Ser
                                                    1


aac cat gcc tca tca ctt ctg cat tac tat tca cat ctc atc ata att    225
Asn His Ala Ser Ser Leu Leu His Tyr Tyr Ser His Leu Ile Ile Ile
 5                 10              15                  20


gca tac ttt tct gta ttt gct tca atc gaa ata caa gaa att cca tca    273
Ala Tyr Phe Ser Val Phe Ala Ser Ile Glu Ile Gln Glu Ile Pro Ser
                25              30                  35


tat cca gca tgt agc aat ggc gaa tca cct gtc ttt tta ctc caa cac    321
Tyr Pro Ala Cys Ser Asn Gly Glu Ser Pro Val Phe Leu Leu Gln His
                40              45                  50


aat gct aca gca ggt aat gtt ctg aag cga gct tca act tca cat ctg    369
Asn Ala Thr Ala Gly Asn Val Leu Lys Arg Ala Ser Thr Ser His Leu
         55              60                  65


gtc gac tgc act gac ctt tgt tca gct aac gat gaa tgt ttg gcg ata    417
Val Asp Cys Thr Asp Leu Cys Ser Ala Asn Asp Glu Cys Leu Ala Ile
     70              75                  80


acc tat gaa gat aaa gaa tgc aaa atg ttg tca agc att gga gaa tcg    465
Thr Tyr Glu Asp Lys Glu Cys Lys Met Leu Ser Ser Ile Gly Glu Ser
 85              90                  95                  100


aca gga cat tta aat gat tat gta ttg ctg agt aaa aat tgt gct aaa    513
Thr Gly His Leu Asn Asp Tyr Val Leu Leu Ser Lys Asn Cys Ala Lys
                105             110                 115


agt gcg cgg atc tgc tca tcg cca ttt caa ttc gat gta cac aga caa    561
Ser Ala Arg Ile Cys Ser Ser Pro Phe Gln Phe Asp Val His Arg Gln
                120             125                 130


aaa att ttg gtt ggg ttt gct cgc gag gtt gtg tca gct gat tca tta    609
```

```
Lys Ile Leu Val Gly Phe Ala Arg Glu Val Val Ser Ala Asp Ser Leu
        135               140                   145
```

```
tcg tta tgt cta tca gct tgc ttg aat gca ttt gat tct ttc ggt ttt       657
Ser Leu Cys Leu Ser Ala Cys Leu Asn Ala Phe Asp Ser Phe Gly Phe
        150               155                   160
```

```
gaa tgt gag tcg gta atg tac tat cca gtt gat tca gaa tgc atc cta       705
Glu Cys Glu Ser Val Met Tyr Tyr Pro Val Asp Ser Glu Cys Ile Leu
165               170                   175                   180
```

```
aac acc gaa gat cgt ctg gat cga cct gac ttg ttt ggg gat gaa tta       753
Asn Thr Glu Asp Arg Leu Asp Arg Pro Asp Leu Phe Gly Asp Glu Leu
                185                   190                   195
```

```
gat gat aac gtc att tat ttg gat aac aac tgt gct gga tca cag tgt       801
Asp Asp Asn Val Ile Tyr Leu Asp Asn Asn Cys Ala Gly Ser Gln Cys
                200                   205                   210
```

```
tat gct cca tac ata aca caa tac att gcc gtc gca aat cgt cag cta       849
Tyr Ala Pro Tyr Ile Thr Gln Tyr Ile Ala Val Ala Asn Arg Gln Leu
        215                   220                   225
```

```
gct aac gag ttg gac aga caa ctg atc gct gat cgt gaa tca tgc gag       897
Ala Asn Glu Leu Asp Arg Gln Leu Ile Ala Asp Arg Glu Ser Cys Glu
        230                   235                   240
```

```
tcg tta tgt act cag cga ctg tct aca acg aca aac gat ttc aac tgt       945
Ser Leu Cys Thr Gln Arg Leu Ser Thr Thr Thr Asn Asp Phe Asn Cys
245               250                   255                   260
```

```
aaa tca ttt atg cat aat ccg gaa act aac gtt tgc ata ctt tct gat       993
Lys Ser Phe Met His Asn Pro Glu Thr Asn Val Cys Ile Leu Ser Asp
                265                   270                   275
```

```
gaa cgt tct aaa cca ctt ggt cga ggc aat cta gtg aaa gct gac ggt      1041
Glu Arg Ser Lys Pro Leu Gly Arg Gly Asn Leu Val Lys Ala Asp Gly
                280                   285                   290
```

```
ttc aca tat tat gag aag aaa tgt ttt gca tca cca cga aca tgt cgc      1089
Phe Thr Tyr Tyr Glu Lys Lys Cys Phe Ala Ser Pro Arg Thr Cys Arg
        295                   300                   305
```

```
aat gta ccg tcg ttt gag cgc ata cct cag atg ata ctt gtt ggt ttt      1137
Asn Val Pro Ser Phe Glu Arg Ile Pro Gln Met Ile Leu Val Gly Phe
        310                   315                   320
```

```
gct gca ttt gtt atg gaa aat gta cct tca gta acg atg tgc ctc gat      1185
Ala Ala Phe Val Met Glu Asn Val Pro Ser Val Thr Met Cys Leu Asp
325               330                   335                   340
```

```
cag tgc aca aat cct cca ccg gaa act gga gaa aat ttc gaa tgc aaa      1233
Gln Cys Thr Asn Pro Pro Pro Glu Thr Gly Glu Asn Phe Glu Cys Lys
                345                   350                   355
```

```
tct gtg atg tat tat tat aac gaa cag gaa tgt att tta aac gct gaa      1281
Ser Val Met Tyr Tyr Tyr Asn Glu Gln Glu Cys Ile Leu Asn Ala Glu
```

```
                 360                     365                     370

aca cga gaa aat aaa tcg gaa ttg ttt ata ccg gag gga gaa gaa ttc    1329
Thr Arg Glu Asn Lys Ser Glu Leu Phe Ile Pro Glu Gly Glu Glu Phe
        375                 380                 385

caa gtc gat tat ttt gat atc act tgt cat ctg cgc cct gaa aca tgt    1377
Gln Val Asp Tyr Phe Asp Ile Thr Cys His Leu Arg Pro Glu Thr Cys
        390                 395                 400

cca aat ggc aca aca tta cat act gta cgt acg gtt aat gca gca ctc    1425
Pro Asn Gly Thr Thr Leu His Thr Val Arg Thr Val Asn Ala Ala Leu
405                 410                 415                 420

cct gaa ggc gaa gga tcg atc cat att ttg cag tca gcc ggg aat tcg    1473
Pro Glu Gly Glu Gly Ser Ile His Ile Leu Gln Ser Ala Gly Asn Ser
                425                 430                 435

gtt gct gat tgc atg aca aaa tgt tac gag atg gct ccc gag aaa tgt    1521
Val Ala Asp Cys Met Thr Lys Cys Tyr Glu Met Ala Pro Glu Lys Cys
                440                 445                 450

cgc gca ttc aat ttt gat aag cag aca tct gac tgt gac ctg ctg tac    1569
Arg Ala Phe Asn Phe Asp Lys Gln Thr Ser Asp Cys Asp Leu Leu Tyr
        455                 460                 465

gtt gat ggg aag aca acc tta cga cca gca gtc cac tcg ggc att gat    1617
Val Asp Gly Lys Thr Thr Leu Arg Pro Ala Val His Ser Gly Ile Asp
        470                 475                 480

ctc tac gac ctt cat tgc cta gag cag aca aaa gtt tgc gct cag aaa    1665
Leu Tyr Asp Leu His Cys Leu Glu Gln Thr Lys Val Cys Ala Gln Lys
485                 490                 495                 500

aac aac gta aca cga ttt tcg aga tat ttg tac agt ata tat gat gca    1713
Asn Asn Val Thr Arg Phe Ser Arg Tyr Leu Tyr Ser Ile Tyr Asp Ala
                505                 510                 515

gtg cca tcg caa ttc tac gaa gca act gcc ctc aca aat tgt ctt aat    1761
Val Pro Ser Gln Phe Tyr Glu Ala Thr Ala Leu Thr Asn Cys Leu Asn
                520                 525                 530

ctt tgc gca tat acc gag cgt tgc gaa ggt gta aat tac aac aga agg    1809
Leu Cys Ala Tyr Thr Glu Arg Cys Glu Gly Val Asn Tyr Asn Arg Arg
        535                 540                 545

aat ggt cgt tgt gaa tta ttt gat aag gtc gaa gga aat gga aag cca    1857
Asn Gly Arg Cys Glu Leu Phe Asp Lys Val Glu Gly Asn Gly Lys Pro
        550                 555                 560

agt gat ttc acg gat ttt tac aaa aat ctt tgt ctg gtg gaa gaa gta    1905
Ser Asp Phe Thr Asp Phe Tyr Lys Asn Leu Cys Leu Val Glu Glu Val
565                 570                 575                 580

gaa tca gaa tat agc gcc gca gct aat gtt ccc aaa cat ctc ctt ccg    1953
Glu Ser Glu Tyr Ser Ala Ala Ala Asn Val Pro Lys His Leu Leu Pro
                585                 590                 595
```

```
aat gtt tca cat tct gca gtt act cag aaa caa gaa gct aaa tta cac       2001
Asn Val Ser His Ser Ala Val Thr Gln Lys Gln Glu Ala Lys Leu His
            600                 605                 610

att atc tca gca aaa aca aag cct ttc cta cgc gaa cag gaa gca cag       2049
Ile Ile Ser Ala Lys Thr Lys Pro Phe Leu Arg Glu Gln Glu Ala Gln
            615                 620                 625

cga cga gct cca gaa aca ata aca gcg aag tcg tct tca gct tcc gga       2097
Arg Arg Ala Pro Glu Thr Ile Thr Ala Lys Ser Ser Ser Ala Ser Gly
    630                 635                 640

aaa gta agt ggt gaa gca gga tca tca act aca ttc agc att tct tca       2145
Lys Val Ser Gly Glu Ala Gly Ser Ser Thr Thr Phe Ser Ile Ser Ser
645                 650                 655                 660

tcc gga agg ctt cca ggg cca gta gtc caa att gct cca aat gca gtg       2193
Ser Gly Arg Leu Pro Gly Pro Val Val Gln Ile Ala Pro Asn Ala Val
                665                 670                 675

caa aca gtt tgc aat tat gaa ggc atc aaa gtg cag atg gag aac ccc       2241
Gln Thr Val Cys Asn Tyr Glu Gly Ile Lys Val Gln Met Glu Asn Pro
                680                 685                 690

aaa gcc ttt tcg gga gtg ata ttt gtt aaa aat agg tat gaa acc tgt       2289
Lys Ala Phe Ser Gly Val Ile Phe Val Lys Asn Arg Tyr Glu Thr Cys
            695                 700                 705

cga gta gag gtt acg gat agt gaa agt gca cca cta gta att ggt tta       2337
Arg Val Glu Val Thr Asp Ser Glu Ser Ala Pro Leu Val Ile Gly Leu
    710                 715                 720

cca ccg aat ttt ggt tca aaa atg gta gct gat gaa aag gtt gcc gca       2385
Pro Pro Asn Phe Gly Ser Lys Met Val Ala Asp Glu Lys Val Ala Ala
725                 730                 735                 740

agc gaa gca aat att caa cca gaa ata tcc gga ggc gac aaa ctg gat       2433
Ser Glu Ala Asn Ile Gln Pro Glu Ile Ser Gly Gly Asp Lys Leu Asp
                745                 750                 755

aaa ccc gct gat gaa ctg cgc ata aga cga caa gct tta gag cta cac       2481
Lys Pro Ala Asp Glu Leu Arg Ile Arg Arg Gln Ala Leu Glu Leu His
            760                 765                 770

aga gat tgc gga atc cag gat atg aac aat ggt act tat aaa tca acg       2529
Arg Asp Cys Gly Ile Gln Asp Met Asn Asn Gly Thr Tyr Lys Ser Thr
            775                 780                 785

gtg gtt gta caa aca aat aac ttg ggt ata cct gga ctg gta act tcc       2577
Val Val Val Gln Thr Asn Asn Leu Gly Ile Pro Gly Leu Val Thr Ser
            790                 795                 800

atg gat cag att ttt gaa gtg agc tgt gat tat agt tca atg ctt ggt       2625
Met Asp Gln Ile Phe Glu Val Ser Cys Asp Tyr Ser Ser Met Leu Gly
805                 810                 815                 820
```

```
gga aaa gtt act gct ggt gcc aat ctc aca att gat ggt ccc gaa gca    2673
Gly Lys Val Thr Ala Gly Ala Asn Leu Thr Ile Asp Gly Pro Glu Ala
            825             830                 835  .


tct ctt att caa ccc cga gga aaa atc gaa ctt ggt aac ccg gtg ctt    2721
Ser Leu Ile Gln Pro Arg Gly Lys Ile Glu Leu Gly Asn Pro Val Leu
            840             845         ·   850


atg cag atg ttg agt gga caa gga gaa cct gtc cta caa gca aaa cta    2769
Met Gln Met Leu Ser Gly Gln Gly Glu Pro Val Leu Gln Ala Lys Leu
            855             860             865


ggt gac att ctg cag cta cga tgg gaa atc atg gcg atg              2808
Gly Asp Ile Leu Gln Leu Arg Trp Glu Ile Met Ala Met
    870         ·   875             880
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<400> 10
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Met Val Thr Lys Ile Pro Thr Phe Pro Leu Leu Phe Ile Phe Pro Phe
 1               5                   10                  15
Leu Phe Thr Phe Leu Thr Thr Lys Cys Gln Ala Tyr Ser Ile Pro Leu
            20                  25                  30
Ile Ser Glu Cys Asn Ser Glu Glu Ala Pro Val Phe Leu Leu Gln Arg
        35                  40                  45
Asn Val Ser Ser Ile Ala Gly Thr Glu Pro Leu Arg Thr Val Pro Val
    50                  55                  60
Thr Gly Gly Phe Leu Glu Cys Ala Glu Leu Cys Ser Ala Ala Asn Asn
65                  70                  75                  80
Cys Val Ala Val Lys Phe Ser Ile Glu Lys Gln Cys Gln Leu Leu Gly
            85                  90                  95
Lys Thr Thr Met Thr Ala Thr Thr Leu Ser Leu Gln Asp Ile Asn Leu
            100                 105                 110
Thr Leu Ala Arg Leu Ala Thr Lys Ser Cys Val Lys Ser Lys Lys Ile
            115                 120                 125
Cys Ser Ser Pro Phe His Phe Asp Val His Glu Gln Lys Ile Leu Val
        130                 135             .   140      .
Gly Phe Ala Arg Glu Val Val Ser Ala Glu Ser Ile His Gln Cys Leu
145                 150                 155                 160
Thr Ala Cys Leu Asp Ala Val Asp Thr Phe Gly Phe Glu Cys Glu Ser
                165         .       170                 175
Val Met Tyr Tyr Pro Leu Asp Ala Glu Cys Ile Leu Asn Thr Glu Asp
            180                 185                 190
Arg Leu Asp Arg Pro Asp Leu Phe Val Asp Glu Lys Glu Asp Thr Val
            195             200             205
Val Tyr Leu Asp Asn Asn Cys Ala Gly Ser Gln Cys His Ala Pro Tyr
    210                 215                 220
Val Thr Gln Tyr Val Ala Val Glu Gly Lys Gln Leu Ala Glu Glu Leu
225                 230                 235                 240
Asp His Asn Phe Glu Gly Met Glu Leu Thr Glu Cys Glu Gln Leu Cys
            245                 250                 255
Asn Gln Arg Leu Ser Val Ser Ala Asn Asp Phe Asn Cys Lys Ala Phe
            260                 265                 270
```

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Met Tyr Asn Asn Gln Thr Arg Ser Cys Ile Leu Ser Asp Glu Arg Ser
    275                 280                 285
Arg Pro Leu Gly Arg Ala Asn Leu Thr Asp Ala Lys Gly Trp Thr Tyr
    290                 295                 300
His Glu Lys Lys Cys Phe Ala Ser Pro Arg Thr Cys Arg Asn Val Pro
305                 310                 315                 320
Ser Phe Thr Arg Val Pro Gln Met Leu Leu Val Gly Phe Ala Ser Phe
                325                 330                 335
Val Met Glu Asn Val Pro Ser Val Thr Met Cys Leu Asp Gln Cys Thr
                340                 345                 350
Asn Pro Pro Pro Glu Thr Gly Gln Ser Phe Val Cys Lys Ser Val Met
                355                 360                 365
Tyr Tyr Tyr Asn Glu Gln Glu Cys Ile Leu Asn Ala Glu Ser Arg His
    370                 375                 380
Ser Lys Pro Asp Leu Phe Ile Pro Glu Glu Asp Asp Phe Val Val Asp
385                 390                 395                 400
Tyr Phe Asp Ile Asn Cys Arg Leu Glu Gln Glu Gln Cys Ile Asp Gly
                405                 410                 415
Arg Thr Pro Gln Leu Val Arg Thr Ile Asn Ser Ala Leu Pro Glu Gly
                420                 425                 430
Glu Gly Ser Ile His Val Leu Glu Thr Ile Lys Gly Gly Val Gln Gln
                435                 440                 445
Cys Ala Lys Lys Cys Ser Glu Arg Ala Pro Asp Lys Cys Arg Ser Phe
    450                 455                 460
Asn Phe Asp Lys Gln Ala Gly Asn Cys Asn Leu Leu Tyr Leu Asp Gly
465                 470                 475                 480
Gln Gly Ser Leu Arg Pro Glu Gln Lys Thr Gln Phe Asp Leu Tyr Asp
                485                 490                 495
Val His Cys Leu Ser Gly Thr Ser Gln Leu Leu Gly Glu Asn Ser Lys
                500                 505                 510
His Ser Pro Ser Ala Cys Val Asp Pro Glu Gly Ala Ile Phe Ser Arg
                515                 520                 525
Phe Leu Tyr Thr Arg Trp Val Ala Asn Ser Pro Asn Arg Glu Ile Ser
    530                 535                 540
Ser Leu Pro Leu Ser Lys Cys Leu Asn Leu Cys Ser Val Gly Gly Glu
545                 550                 555                 560
Gln Cys Glu Gly Val Asn Tyr Asn Arg Arg Asn Gly Ser Cys Gln Leu
                565                 570                 575
Phe Thr Ser Leu Leu Leu Asn Ser Ser Pro Asn Ser Gln Gln Asp Lys
                580                 585                 590
Asp Glu His Val Asp Phe Tyr Arg Asn Ile Cys Arg Val Lys Glu Ser
                595                 600                 605
Lys Ser Asp Ser Gly Ala Ala Asn Val Pro Lys Thr Gln Gln Ala Thr
    610                 615                 620
Ala Ala Pro Pro Pro Ser Val Gln Leu Thr Thr Lys Pro Pro Gln Ile
625                 630                 635                 640
Arg Asp Leu Asn Asn Asn Asn Lys Thr Thr His Lys Glu Pro Asn Ile
                645                 650                 655
Lys Leu Pro Pro Gln Ser Ala Lys Pro Ile Asn Gly Lys Thr Gly Lys
                660                 665                 670
Glu Gln Leu Pro Val Gly Ser Lys Ser Phe Gly Val Thr Asn Thr Arg
    675                 680                 685
Asp Asp Gly Glu Asn Ser Ile Thr Gly Thr Ala Pro Pro Pro Val Asp
    690                 695                 700
Gly Lys Leu Ile Ile Lys Pro Ser Pro Gln Val Ser Ile Pro Ser Pro
705                 710                 715                 720
Val Leu Ile Pro Ala Gln Glu Val His Thr Ile Cys Asn Tyr Glu Gly
```

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                725                     730                     735
Ile Ser Val Gln Ile Lys His Ser Ser Pro Phe Ser Gly Val Val Phe
            740                     745                     750
Val Arg Asn Lys Tyr Asp Thr Cys Arg Val Lys Leu Lys Glu Arg Thr
            755                     760                     765
Ala Leu Phe Trp Phe Trp Gly Phe Gln Gln Ile Leu Glu Met Lys Pro
            770                     775                     780
Ile Ala Leu Ile Asn Ser Gln Lys His Gly Lys Gly Asn Lys Thr His
785                     790                     795                     800
Gly Asp Thr Leu Leu Ser Ile Glu Gly Ser Lys Lys Gln Ile Glu Gly
            805                     810                     815
Gly Ser Ser Thr Glu Asp Ile Gln Leu Ile Asn Ser Gln Lys Asp Leu
            820                     825                     830
Lys Arg Ser Arg Arg Gln Leu Gln Arg Asp Cys Gly Leu Gln Asp Met
            835                     840                     845
Asp Asn Gly Thr Tyr Lys Thr Val Ile Val Val Gln Thr Asn Asn Leu
    850                     855                     860
Gly Ile Pro Gly Leu Val Thr Ser Met Asp Gln Leu Tyr Glu Ile Ser
865                     870                     875                     880
Cys Asn Tyr Ser Ser Met Leu Gly Gly Lys Val Gln Thr Ala Ala Ala
            885                     890                     895
Leu Arg Val His Gly Pro Gln Pro Ser Leu Ile Gln Pro Arg Gly Lys
            900                     905                     910
Ile Glu Leu Gly Asn Pro Val Leu Met Gln Met Gly Pro Val Arg Ser
            915                     920                     925
Glu Arg Gln Ser Gly Glu Gly Pro Leu Ile Gln Ala Lys Leu Gly Asp
    930                     935                     940
Ile Leu Glu Leu Lys Trp Glu Ile Met Ala Met Asp Glu Glu Leu Asp
945                     950                     955                     960
Phe Leu Val Arg Asp Cys Phe Ala Glu Pro Gly Thr Ser Gly Asn Gln
            965                     970                     975
Gly Glu Arg Leu Pro Leu Ile Glu Asn Gly Cys Pro Thr Pro Ala Val
            980                     985                     990
Ala Gln Lys Leu Ile Pro Asn Pro Ile Lys Ala Ile Asn Ser Ala Val
    995                     1000                    1005
Lys Leu Thr Tyr Leu Gln Ala Phe Arg Phe Asp Ser Ser Pro Ala Ile
    1010                    1015                    1020
Arg Ile Thr Cys His Leu Glu Leu Cys Lys Glu Asn Cys Lys Ser Val
1025                    1030                    1035                    1040
Asn Cys Lys Phe Asn Asp Gly Ile Lys Glu Ser Trp Gly Arg Lys Arg
            1045                    1050                    1055
Arg Phe Ala Ile Asp Asn Asn Ile Asn Arg Lys Asn Glu Val Lys Glu
            1060                    1065                    1070
Phe Glu Thr Arg Arg Phe Val Val Pro Arg Phe Ala Gln Ala Thr Thr
            1075                    1080                    1085
Ser Leu Val Ile Val Asp Pro Leu Gln Gln Gln Asn Ser Val Ile Lys
            1090                    1095                    1100
Thr Glu Gln Gln Gln Gln Pro Phe Ile Ser His Ser Ser Ile Ser Lys
1105                    1110                    1115                    1120
Gln Ile Phe Glu Asn Asn Lys Lys Glu Asn Asn Lys Asn Ile Thr Lys
            1125                    1130                    1135
Thr Ala Lys Lys Ser Ser Ser Leu Phe Glu Ala Phe Thr Glu Ala Ala
            1140                    1145                    1150
Gly Gly Arg Lys Ile Asn Leu Glu Leu Thr Thr Thr Asn Ser Glu Gln
            1155                    1160                    1165
Gln Gln Leu Cys Leu His Lys Trp Thr Leu Gly Gly Val Phe Gly Thr
    1170                    1175                    1180
```

Leu Leu Thr Leu Ile Val Val Gln Ser Gly Val Ala Ala Lys His Leu
1185   1190   1195   1200
Ile Asn Arg Phe Ile Val Gly Lys Arg Ile
                1205   1210

<210> 11
<211> 250
<212> PRT
<213> Heterodera glycines

<400> 11
Glu Gln Lys Ile Leu Val Gly Phe Ala Arg Glu Val Val Ser Ala Asp
 1   5   10   15
Ser Val His Arg Cys Leu Ser Ala Cys Leu Asn Ala Phe Asp Thr Phe
        20   25   30
Gly Phe Glu Cys Glu Ser Val Met Tyr Tyr Pro Val Asp Ala Glu Cys
        35   40   45
Ile Leu Asn Thr Glu Asp Arg Leu Asp Arg Pro Asp Leu Phe Val Asp
        50   55   60
Glu His Glu Asp Thr Val Ile Tyr Leu Asp Asn Asn Cys Ala Gly Cys
65   70   75   80
Glu Cys His Trp His Phe Asp Asn Phe Lys Thr Ser Gly Ile Leu Asn
                85   90   95
Asp Gln Gln Phe Ala Ile Ala Ala Gln Cys Tyr Ala Pro Tyr Val Thr
                100   105   110
Gln Tyr Val Ala Val Glu Gly Arg Gln Leu Ser Asp Glu Leu Asp His
        115   120   125
Ser Phe Glu Gly Leu Glu Leu Ser Glu Cys Glu Glu Leu Cys Thr Gln
        130   135   140
Arg Leu Ser Val Thr Ala Asn Asp Phe Asn Cys Lys Ser Phe Met Tyr
145   150   155   160
Ser Asn Leu Thr Arg Ser Cys Val Leu Ser Asp Glu Arg Ser Arg Pro
                165   170   175
Leu Gly Arg Ala Asn Leu Ala Glu Val Pro Gly Trp Thr Tyr Phe Glu
                180   185   190
Ser Arg Gly Val Pro Ser Phe Thr Arg Val Pro Gln Met Leu Leu Val
                195   200   205
Gly Phe Ala Ser Phe Val Met Glu Asn Val Pro Ser Val Thr Met Cys
        210   215   220
Leu Asp Gln Cys Thr Ser Pro Pro Pro Glu Thr Gly Gln Asn Phe Val
225   230   235   240
Cys Lys Ser Val Met Tyr Tyr Tyr Asn Glu
                245   250

<210> 12
<211> 881
<212> PRT
<213> Brugia malayi

<400> 12
Met His Leu Ser Asn His Ala Ser Ser Leu Leu His Tyr Tyr Ser His
 1   5   10   15
Leu Ile Ile Ile Ala Tyr Phe Ser Val Phe Ala Ser Ile Glu Ile Gln
        20   25   30
Glu Ile Pro Ser Tyr Pro Ala Cys Ser Asn Gly Glu Ser Pro Val Phe
        35   40   45
Leu Leu Gln His Asn Ala Thr Ala Gly Asn Val Leu Lys Arg Ala Ser

```
          50                      55                      60
Thr Ser His Leu Val Asp Cys Thr Asp Leu Cys Ser Ala Asn Asp Glu
65                      70                      75                      80
Cys Leu Ala Ile Thr Tyr Glu Asp Lys Glu Cys Lys Met Leu Ser Ser
                85                      90                      95
Ile Gly Glu Ser Thr Gly His Leu Asn Asp Tyr Val Leu Leu Ser Lys
                100                     105                     110
Asn Cys Ala Lys Ser Ala Arg Ile Cys Ser Ser Pro Phe Gln Phe Asp
                115                     120                     125
Val His Arg Gln Lys Ile Leu Val Gly Phe Ala Arg Glu Val Val Ser
                130                     135                     140
Ala Asp Ser Leu Ser Leu Cys Leu Ser Ala Cys Leu Asn Ala Phe Asp
145                     150                     155                     160
Ser Phe Gly Phe Glu Cys Glu Ser Val Met Tyr Tyr Pro Val Asp Ser
                165                     170                     175
Glu Cys Ile Leu Asn Thr Glu Asp Arg Leu Asp Arg Pro Asp Leu Phe
                180                     185                     190
Gly Asp Glu Leu Asp Asp Asn Val Ile Tyr Leu Asp Asn Asn Cys Ala
                195                     200                     205
Gly Ser Gln Cys Tyr Ala Pro Tyr Ile Thr Gln Tyr Ile Ala Val Ala
                210                     215                     220
Asn Arg Gln Leu Ala Asn Glu Leu Asp Arg Gln Leu Ile Ala Asp Arg
225                     230                     235                     240
Glu Ser Cys Glu Ser Leu Cys Thr Gln Arg Leu Ser Thr Thr Thr Asn
                245                     250                     255
Asp Phe Asn Cys Lys Ser Phe Met His Asn Pro Glu Thr Asn Val Cys
                260                     265                     270
Ile Leu Ser Asp Glu Arg Ser Lys Pro Leu Gly Arg Gly Asn Leu Val
                275                     280                     285
Lys Ala Asp Gly Phe Thr Tyr Tyr Glu Lys Lys Cys Phe Ala Ser Pro
                290                     295                     300
Arg Thr Cys Arg Asn Val Pro Ser Phe Glu Arg Ile Pro Gln Met Ile
305                     310                     315                     320
Leu Val Gly Phe Ala Ala Phe Val Met Glu Asn Val Pro Ser Val Thr
                325                     330                     335
Met Cys Leu Asp Gln Cys Thr Asn Pro Pro Pro Glu Thr Gly Glu Asn
                340                     345                     350
Phe Glu Cys Lys Ser Val Met Tyr Tyr Tyr Asn Glu Gln Glu Cys Ile
                355                     360                     365
Leu Asn Ala Glu Thr Arg Glu Asn Lys Ser Glu Leu Phe Ile Pro Glu
                370                     375                     380
Gly Glu Glu Phe Gln Val Asp Tyr Phe Asp Ile Thr Cys His Leu Arg
385                     390                     395                     400
Pro Glu Thr Cys Pro Asn Gly Thr Thr Leu His Thr Val Arg Thr Val
                405                     410                     415
Asn Ala Ala Leu Pro Glu Gly Glu Gly Ser Ile His Ile Leu Gln Ser
                420                     425                     430
Ala Gly Asn Ser Val Ala Asp Cys Met Thr Lys Cys Tyr Glu Met Ala
                435                     440                     445
Pro Glu Lys Cys Arg Ala Phe Asn Phe Asp Lys Gln Thr Ser Asp Cys
                450                     455                     460
Asp Leu Leu Tyr Val Asp Gly Lys Thr Thr Leu Arg Pro Ala Val His
465                     470                     475                     480
Ser Gly Ile Asp Leu Tyr Asp Leu His Cys Leu Glu Gln Thr Lys Val
                485                     490                     495
Cys Ala Gln Lys Asn Asn Val Thr Arg Phe Ser Arg Tyr Leu Tyr Ser
                500                     505                     510
```

```
Ile Tyr Asp Ala Val Pro Ser Gln Phe Tyr Glu Ala Thr Ala Leu Thr
        515                 520                 525
Asn Cys Leu Asn Leu Cys Ala Tyr Thr Glu Arg Cys Glu Gly Val Asn
    530                 535                 540
Tyr Asn Arg Arg Asn Gly Arg Cys Glu Leu Phe Asp Lys Val Glu Gly
545                 550                 555                 560
Asn Gly Lys Pro Ser Asp Phe Thr Asp Phe Tyr Lys Asn Leu Cys Leu
                565                 570                 575
Val Glu Glu Val Glu Ser Glu Tyr Ser Ala Ala Ala Asn Val Pro Lys
                580                 585                 590
His Leu Leu Pro Asn Val Ser His Ser Ala Val Thr Gln Lys Gln Glu
            595                 600                 605
Ala Lys Leu His Ile Ile Ser Ala Lys Thr Lys Pro Phe Leu Arg Glu
    610                 615                 620
Gln Glu Ala Gln Arg Arg Ala Pro Glu Thr Ile Thr Ala Lys Ser Ser
625                 630                 635                 640
Ser Ala Ser Gly Lys Val Ser Gly Glu Ala Gly Ser Ser Thr Thr Phe
                645                 650                 655
Ser Ile Ser Ser Ser Gly Arg Leu Pro Gly Pro Val Val Gln Ile Ala
                660                 665                 670
Pro Asn Ala Val Gln Thr Val Cys Asn Tyr Glu Gly Ile Lys Val Gln
            675                 680                 685
Met Glu Asn Pro Lys Ala Phe Ser Gly Val Ile Phe Val Lys Asn Arg
        690                 695                 700
Tyr Glu Thr Cys Arg Val Glu Val Thr Asp Ser Glu Ser Ala Pro Leu
705                 710                 715                 720
Val Ile Gly Leu Pro Pro Asn Phe Gly Ser Lys Met Val Ala Asp Glu
                725                 730                 735
Lys Val Ala Ala Ser Glu Ala Asn Ile Gln Pro Glu Ile Ser Gly Gly
                740                 745                 750
Asp Lys Leu Asp Lys Pro Ala Asp Glu Leu Arg Ile Arg Arg Gln Ala
        755                 760                 765
Leu Glu Leu His Arg Asp Cys Gly Ile Gln Asp Met Asn Asn Gly Thr
    770                 775                 780
Tyr Lys Ser Thr Val Val Val Gln Thr Asn Asn Leu Gly Ile Pro Gly
785                 790                 795                 800
Leu Val Thr Ser Met Asp Gln Ile Phe Glu Val Ser Cys Asp Tyr Ser
                805                 810                 815
Ser Met Leu Gly Gly Lys Val Thr Ala Gly Ala Asn Leu Thr Ile Asp
            820                 825                 830
Gly Pro Glu Ala Ser Leu Ile Gln Pro Arg Gly Lys Ile Glu Leu Gly
        835                 840                 845
Asn Pro Val Leu Met Gln Met Leu Ser Gly Gln Gly Glu Pro Val Leu
    850                 855                 860
Gln Ala Lys Leu Gly Asp Ile Leu Gln Leu Arg Trp Glu Ile Met Ala
865                 870                 875                 880
Met
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<210> 13
<211> 3633
<212> DNA
<213> Meloidogyne javanica

<400> 13
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atggttacaa aaatcccaac ttttcccctc cttttattt tcccatttt atttacattt    60
ttaacgacaa aatgtcaggc ttattctata ccattaatat cagaatgtaa ttcggaagaa   120
```

```
gccccagttt ttcttttgca acggaatgtt tcttctatcg ccggaactga gcctttaaga    180
actgttcctg ttacagggrg attttttggaa tgtgcggaac tttgttcagc agcaaataat    240
tgtgttgctg ttaaattttc tattgaaaaa caatgccaat tgttggggaa aacaactatg    300
acagcaacaa ctttatcttt acaagacatt aatttgacac tagctagatt agctactaaa    360
agttgtgtta agagcaaaaa aatctgttct tcccccttcc attttgatgt tcacgaacaa    420
aaaatacttg ttggttttgc tagagaagtt gtatcagcag aatctataca tcaatgttta    480
actgcttgtt tagatgctgt tgatactttt ggctttgaat gcgagtcagt aatgtattat    540
ccattggatg ccgaatgtat tttaaataca gaagacagac ttgaccgtcc agatttgttt    600
gttgatgaga aggaagatac tgttgtttat ttggataata attgtgctgg atcccaatgt    660
catgcccctt atgtaaccca atatgtagct gttgaaggaa acaattagc tgaggaattg     720
gatcataatt ttgagggaat ggagttgaca gaatgtgaac agctttgtaa tcaaagattg    780
agtgtttctg caaatgactt taattgcaaa gcatttatgt acaataacca aacaagatct    840
tgtattcttt ctgatgaacg ttcaagacct ttgggtagag ctaatttgac agatgctaaa    900
ggatggactt atcacgagaa aaaatgtttt gcctccccac gtacatgccg aaatgttcct    960
tcttttaccc gcgtccctca aatgttatta gttggatttg cctctttgt aatggaaaat    1020
gtcccttcag taactatgtg tttggatcaa tgtacaaatc ctcccccaga aactggacaa    1080
agttttgttt gtaaatctgt catgtattat tataatgagc aagaatgtat tttaaatgct    1140
gaatcacgtc attccaagcc agatttattt attcccgaag aagacgattt tgttgtagat    1200
tattttgata taaattgccg tctagaacaa gaacaatgta tcgatggaag aacgccccaa    1260
ttagttagaa caattaattc tgcacttcca gaaggggagg ggtctataca tgttttggaa    1320
acaattaagg gaggagttca gcaatgtgct aaaaaatgtt ctgaacgcgc cccagacaaa    1380
tgtcgctctt tcaattttga taaacaagct ggtaattgta atttactta  tttggatgga    1440
caagggtctt tacgaccaga gcaaaagaca caattcgatt tatacgatgt tcattgtttg    1500
agtggaacat ctcaactttt aggagaaaat tctaaacatt ctccctctgc ttgtgttgac    1560
ccagaagggg ctattttag tcgtttcctc tacactcgtt gggtagcaaa ttctcccaat    1620
cgtgaaattt caagtttacc actttccaaa tgtttaaatc tttgttcggt tggaggagaa    1680
caatgtgagg gtgttaatta caatcgccga aatggttctt gtcaattatt tacttccctt    1740
ctattaaact cttctccaaa ttctcaacaa gacaaagacg aacatgttga tttttacaga    1800
aatatttgta gagttaagga atcgaaaagt gatagtgggg ctgctaatgt acccaaaaca    1860
caacaagcaa cggctgcacc tccccccttct gttcaattaa ctactaaacc tccacaaatt    1920
cgtgatttaa acaacaacaa taaaacaaca cacaagaac caaatattaa acttccacca     1980
caatcagcaa aacctataaa tggaaaaact ggaaggaac aacttcctgt agggtcaaaa     2040
tcttttgggg ttactaatac gcgtgatgat ggggagaatt caataactgg aactgctcct    2100
cctcctgtag atggcaaat aattattaaa ccttcaccac aagtttctat tccctcccct     2160
gtacttattc cggcacaaga agtacatact atttgtaatt atgaaggaat tagtgttcaa    2220
attaaacatt cttctccatt ctctggcgtt gtttttgttc gaaataaata tgatacttgc    2280
cgtgtgaagt tgaaggaaag gacagcgttg ttttggtttt ggggcttcca gcaaattttg    2340
gaaatgaagc caattgcttt aattaattca caaaaacatg gaaaagggaa taaaacacac    2400
ggagatactt tactttctat tgaaggttcc aaaaaacaaa ttgaaggggg ttcttcaact    2460
gaagatattc aattaataaa ttctcaaaaa gaccttaaac gttcaagaag acaattacaa    2520
agagattgtg gattacaaga tatggacaat ggaacttaca aaactgttat tgttgtccaa    2580
acaaataatt tgggaattcc gggacttgtt acttctatgg accaacttta tgagatttcc    2640
tgtaactatt caagtatgtt gggaggcaaa gtccaaacag cagctgcatt acgtgttcac    2700
ggtccccaac cttcactaat ccagcctcgc ggcaaaatag aattgggaaa tcctgttttg    2760
atgcaaatgg ggcctgtacg tagtgaaagg caaagtgggg aagggccttt aattcaagct    2820
aaaattgggg atattcttga attaaaatgg gaaattatgg caatggatga agaattggac    2880
tttttagttc gtgattgttt tgcagagccg ggaacttctg gaaatcaagg ggaaagactt    2940
cctttaattg agaatggttg tccaacacca gcagtagcac aaaaaattaat tccaaatcca    3000
ataaaagcaa ttaattctgc agttaaatta acttatttac aagcattcag atttgacagt    3060
tctccagcta ttagaataac ttgtcatttta gaattatgta aagaaaattg taaatcggtt    3120
aattgtaaat ttaatgatgg aattaaagaa tcgtggggca gaaaacgccg ttttgctatt    3180
gacaataaca ttaataggaa aaatgaagtt aaagaattcg aaactcgccg ttttgtcgtt    3240
ccccgttttg cccaagcaac aacttcttta gttattgtag accctttaca acaacaaat     3300
tctgttataa aaacagaaca acaacaacaa ccattattt cacattcctc aatatctaaa     3360
caaatatttg aaaataataa aaagaaaat aataaaaata aacaaaaac agctaaaaaa      3420
tcctcttctc tttttgaagc ttttactgag gctgctggtg gaaggaaaat taatttagaa    3480
ttaacaacaa caaattcaga acaacaacaa ctttgtttac ataaatggac acttgggggt    3540
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gttttttggaa ctctttttaac attaattgtt gttcaaagcg gggttgctgc taaacattta      3600
attaatcgat ttattgttgg aaaaagaatt taa                                       3633
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<210> 14
<211> 750
<212> DNA
<213> Heterodera glycines

<400> 14
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gagcagaaga ttttggtggg tttcgcgcgg gaggtggtct ccgccgactc agtccaccgc        60
tgtctgtccg cttgtctgaa tgcgttcgat acgttcggct tcgaatgcga gtcggtcatg       120
tattaccctg tggacgcgga atgcattttg aacacggagg accgattgga tcggcctgac       180
ctttttcgtgg acgagcacga ggacacggtc atctacttgg acaacaattg cgccggatgt      240
gagtgccatt ggcattttga caatttcaaa acaagcggca ttttgaacga ccaacaattc       300
gcaattgcag cacaatgtta cgcaccgtac gtaacgcaat acgtggcggt ggaaggacgc       360
caattgtcgg acgaattgga ccacagtttt gaagggttgg agctgagcga atgtgaagag       420
ttgtgcacgc aacggttaag tgttacggca aacgacttca actgcaaatc gttcatgtac       480
agtaacttga cgcgcagttg cgttttgtcg dacgaacgct cgcgccctt gggccgtgcc        540
aatttggccg aagtgccggg atggacttat ttcgagagcc gcggcgttcc gtcgtttacg       600
cgagtgccgc aaatgctttt ggtgggcttt gcctcttttg tgatggaaaa tgtgccgtca       660
gtgacaatgt gtttggacca atgcacaagc cctcctcctg agacgggaca aaactttgtg       720
tgtaaatcgg tgatgtacta ctacaacgag                                         750
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<210> 15
<211> 2643
<212> DNA
<213> Brugia malayi

<400> 15
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atgcatcttt ccaaccatgc ctcatcactt ctgcattact attcacatct catcataatt        60
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agcaatggcg aatcacctgt ctttttactc caacacaatg ctacagcagg taatgttctg       180
aagcgagctt caacttcaca tctggtcgac tgcactgacc tttgttcagc taacgatgaa       240
tgtttggcga taacctatga agataaagaa tgcaaaatgt tgtcaagcat ggagaatcg        300
acaggacatt taaatgatta tgtattgctg agtaaaaatt gtgctaaaag tgcgcggatc       360
tgctcatcgc catttcaatt cgatgtacac agacaaaaaa ttttggttgg gtttgctcgc       420
gaggttgtgt cagctgattc attatcgtta tgtctatcag cttgcttgaa tgcatttgat       480
tctttcggtt ttgaatgtga gtcggtaatg tactatccag ttgattcaga atgcatccta       540
aacaccgaag atcgtctgga tcgacctgac ttgtttgggg atgaattaga tgataacgtc       600
atttatttgg ataacaactg tgctggatca cagtgttatg ctccatacat aacacaatac       660
attgccgtcg caaatcgtca gctagctaac gagttggaca gacaactgat cgctgatcgt       720
gaatcatgcg agtcgttatg tactcagcga ctgtctacaa cgacaaacga tttcaactgt       780
aaatcatttta tgcataatcc ggaaactaac gtttgcatac tttctgatga acgttctaaa      840
ccacttggtc gaggcaatct agtgaaagct gacggtttca catattatga gaagaaatgt       900
tttgcatcac cacgaacatg tcgcaatgta ccgtcgtttg agcgcatacc tcagatgata       960
cttgttggtt ttgctgcatt tgttatggaa aatgtacctt cagtaacgat gtgcctcgat      1020
cagtgcacaa atcctccacc ggaaactgga gaaaatttcg aatgcaaatc tgtgatgtat      1080
tattataacg aacaggaatg tattttaaac gctgaaacac gagaaaataa atcggaattg      1140
tttataccgg agggagaaga attccaagtc gattattttg atatcacttg tcatctgcgc      1200
cctgaaacat gtccaaatgg cacaacatta catactgtac gtacggttaa tgcagcactc      1260
cctgaaggcg aaggatcgat ccatattttg cagtcagccg ggaattcggt tgctgattgc      1320
atgacaaaat gttacgagat ggctcccgag aaatgtcgcg cattcaattt tgataagcag      1380
acatctgact gtgacctgct gtacgttgat gggaagacaa ccttacgacc agcagtccac      1440
tcgggcattg atctctacga ccttcattgc ctagagcaga caaaagtttg cgctcagaaa      1500
aacaacgtaa cacgattttc gagatatttg tacagtatat atgatgcagt gccatcgcaa      1560
ttctacgaag caactgccct cacaaattgt cttaatcttt gcgcatatac cgagcgttgc      1620
gaaggtgtaa attacaacag aaggaatggt cgttgtgaat tatttgataa ggtcgaagga      1680
```

```
aatggaaagc caagtgattt cacggatttt tacaaaaatc tttgtctggt ggaagaagta    1740
gaatcagaat atagcgccgc agctaatgtt cccaaacatc tccttccgaa tgtttcacat    1800
tctgcagtta ctcagaaaca agaagctaaa ttacacatta tctcagcaaa aacaaagcct    1860
ttcctacgcg aacaggaagc acagcgacga gctccagaaa caataacagc gaagtcgtct    1920
tcagcttccg gaaaagtaag tggtgaagca ggatcatcaa ctacattcag catttcttca    1980
tccggaaggc ttccagggcc agtagtccaa attgctccaa atgcagtgca aacagtttgc    2040
aattatgaag gcatcaaagt gcagatggag aaccccaaag cctttttcggg agtgatattt    2100
gttaaaaata ggtatgaaac ctgtcgagta gaggttacgg atagtgaaag tgcaccacta    2160
gtaattggtt taccaccgaa ttttggttca aaaatggtag ctgatgaaaa ggttgccgca    2220
agcgaagcaa atattcaacc agaaatatcc ggaggcgaca aactggataa acccgctgat    2280
gaactgcgca taagacgaca agctttagag ctacacagag attgcggaat ccaggatatg    2340
aacaatggta cttataaatc aacggtggtt gtacaaacaa ataacttggg tatacctgga    2400
ctggtaactt ccatggatca gatttttgaa gtgagctgtg attatagttc aatgcttggt    2460
ggaaaagtta ctgctggtgc caatctcaca attgatggtc ccgaagcatc tcttattcaa    2520
ccccgaggaa aaatcgaact tggtaacccg gtgcttatgc agatgttgag tggacaagga    2580
gaacctgtcc tacaagcaaa actaggtgac attctgcagc tacgatggga aatcatggcg    2640
atg                                                                   2643
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<210> 16
<211> 1065
<212> PRT
<213> Caenorhabditis elegans

<400> 16

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Met Lys Val Phe Ala Val Leu Ala Leu Val Val Ala Ser Val Leu Ala
 1               5                   10                  15
Asp Thr Leu Pro Ser Val Thr Leu Cys Pro Pro Glu Thr Gln Thr Ile
            20                  25                  30
Phe Val Leu Gln His Asn Thr Thr Val Gly Ala Arg Ile Arg Thr Ile
        35                  40                  45
Pro Thr Ser Asn Leu Ala Glu Cys Ser Asp His Cys Ser Ala Ser Leu
    50                  55                  60
Asp Cys Gln Gly Val Glu Phe Lys Asp Gly Ser Cys Ala Val Phe Arg
65                  70                  75                  80
Ala Gly Ser Glu Lys Ala Thr Ala Gly Ser Gln Leu Leu Thr Lys Thr
                85                  90                  95
Cys Val Lys Ser Asp Arg Val Cys Gln Ser Pro Phe Gln Phe Asp Leu
            100                 105                 110
Phe Glu Gln Arg Ile Leu Val Gly Phe Ala Arg Glu Val Val Pro Ala
        115                 120                 125
Ala Asn Ile Gln Ile Cys Met Ala Ala Cys Leu Asn Ala Phe Asp Thr
    130                 135                 140
Phe Gly Phe Glu Cys Glu Ser Ala Met Phe Tyr Pro Val Asp Gln Glu
145                 150                 155                 160
Cys Ile Leu Asn Thr Glu Asp Arg Leu Asp Arg Pro Ser Leu Phe Val
                165                 170                 175
Glu Glu Ser Asp Asp Thr Val Ile Tyr Met Asp Asn Asn Cys Ala Gly
            180                 185                 190
Phe Pro Leu Val Phe Lys Asn Tyr Asn Tyr Gln Lys Thr Thr Phe Ser
        195                 200                 205
Lys Ser Gln Cys Tyr Pro Pro Tyr Ile Thr Gln Tyr Ile Ala Val Glu
    210                 215                 220
Gly Lys Gln Leu Lys Asn Glu Leu Asp Arg Ile Ile Asn Val Asp Leu
225                 230                 235                 240
Asp Ser Cys Gln Ala Leu Cys Thr Gln Arg Leu Ser Ile Ser Ser Asn
                245                 250                 255
Asp Phe Asn Cys Lys Ser Phe Met Tyr Asn Asn Lys Thr Arg Thr Cys
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              260                        265                      270
Ile Leu Ala Asp Glu Arg Ser Lys Pro Leu Gly Arg Ala Asp Leu Ile
         275                  280                  285
Ala Thr Glu Gly Phe Thr Tyr Phe Glu Lys Lys Cys Phe Ala Ser Pro
         290                  295                  300
Asn Thr Cys Arg Asn Val Pro Ser Phe Lys Arg Val Pro Gln Met Ile
305                  310               . 315                  320
Leu Val Gly Phe Ala Ala Phe Val Met Glu Asn Val Pro Ser Val Thr
                 325                  330                  335
Met Cys Leu Asp Gln Cys Thr Asn Pro Pro Glu Thr Gly Asp Gly
         340                  345                  350
Phe Val Cys Lys Ser Val Met Tyr Tyr Tyr Asn Glu Gln Glu Cys Ile
         355                  360                  365
Leu Asn Ser Glu Thr Arg Glu Ser Lys Pro Glu Leu Phe Ile Pro Glu
    370                  375                  380
Gly Glu Glu Phe Leu Val Asp Tyr Phe Asp Ile Thr Cys His Leu Lys
385                  390                  395                  400
Gln Glu Lys Cys Pro Thr Gly Gln His Leu Lys Ala Ile Arg Thr Ile
              405                  410                  415
Asn Ala Ala Leu Pro Glu Gly Glu Ser Glu Leu His Val Leu Lys Ala
         420                  425                  430
Ser Ala Ala Lys Gly Ile Lys Glu Cys Val Ala Lys Cys Phe Gly Leu
         435                  440                  445
Ala Pro Glu Lys Cys Arg Ser Phe Asn Tyr Asp Lys Lys Thr Lys Ser
    450                  455                  460
Cys Asp Leu Leu Tyr Leu Asp Gly His Asn Thr Leu Gln Pro Gln Val
465              . 470                  475                  480
Arg Gln Gly Val Asp Leu Tyr Asp Leu His Cys Leu Ala Val Glu Asn
                 485                  490                  495
Asp Cys Ser Ala Asn Lys Asp Asp Ala Leu Phe Ser Arg Tyr Leu His
              500                  505                  510
Thr Lys Gln Arg Gly Ile Pro Ala Lys Val Tyr Lys Val Val Ser Leu
         515                  520                  525
Asn Ser Cys Leu Glu Val Cys Ala Gly Asn Pro Thr Cys Ala Gly Ala
    530                  535                  540
Asn Tyr Asn Arg Arg Leu Gly Asp Cys Thr Leu Phe Asp Ala Ile Asp
545                  550                  555                  560
Asp Asp Ala Glu Ile Asn Glu His Thr Asp Phe Tyr Lys Asn Leu Cys
                 565                  570                  575
Val Thr Lys Glu Ile Asp Thr Gly Ala Ser Ala Ala Ala Asn Val Pro
         580                  585                  590
Glu Thr Lys His Arg Val Ser Gly Thr Val Val Glu Gly Lys Asp Ser
         595                  600                  605
Lys Ser Gln Leu Leu Ala Thr Lys Lys Val Lys Lys Pro Thr Ile Lys
    610                  615                  620
Asn Thr Glu His Arg Arg Ala Pro Glu Ser Thr Val Pro Ile Gly Pro
625                  630                  635                  640
Pro Val Glu Val Lys Ala Glu Ala Ile Gln Thr Ile Cys Asn Tyr Glu
                 645                  650                  655
Gly Ile Lys Val Gln Ile Asn Asn Gly Glu Pro Phe Ser Gly Val Ile
         660                  665                  670
Phe Val Lys Asn Lys Phe Asp Thr Cys Arg Val Glu Val Ala Asn Ser
         675                  680                  685
Asn Ala Ala Thr Leu Val Leu Gly Leu Pro Lys Asp Phe Gly Met Arg
         690                  695                  700
Pro Ile Ser Leu Asp Asn Ile Asp Asp Asn Glu Thr Gly Lys Asn Lys
705                  710                  715                  720
```

Thr Lys Lys Gly Glu Glu Thr Pro Leu Lys Asp Glu Ile Glu Glu Phe
              725   730   735
Arg Gln Lys Arg Gln Ala Ala Glu Phe Arg Asp Cys Gly Leu Val Asp
              740   745   750
Leu Leu Asn Gly Thr Tyr Lys Ser Thr Val Val Ile Gln Thr Asn Asn
              755   760 .   765
Leu Gly Ile Pro Gly Leu Val Thr Ser Met Asp Gln Leu Tyr Glu Val
          770   775   780
Ser Cys Asp Tyr Ser Ser Met Leu Gly Gly Arg Val Gln Ala Gly Tyr
785   790   795   800
Asn Met Thr Val Thr Gly Pro Glu Ala Asn Leu Ile Gln Pro Arg Gly
              805   810   815
Lys Ile Glu Leu Gly Asn Pro Val Leu Met Gln Leu Leu Asn Gly Asp
              820   825   830
Gly Thr Glu Gln Pro Leu Val Gln Ala Lys Leu Gly Asp Ile Leu Glu
          835   840   845
Leu Arg Trp Glu Ile Met Ala Met Asp Asp Glu Leu Asp Phe Phe Val
          850   855   860
Lys Asn Cys His Ala Glu Pro Gly Val Ala Gly Gly Lys Ala Gly Ala
865   870   875   880
Gly Glu Lys Leu Arg Leu Ile Asp Gly Gly Cys Pro Thr Pro Ala Val
              885   890   895
Ala Gln Lys Leu Ile Pro Gly Ala Ile Glu Ile Lys Ser Ser Ala Val
              900   905   910
Lys Thr Thr Lys Met Gln Ala Phe Arg Phe Asp Ser Ser Ala Ser Ile
          915   920   925
Arg Val Thr Cys Glu Val Glu Ile Cys Lys Gly Asp Cys Glu Pro Val
          930   935   940
Glu Cys Ala Leu Thr Gly Gly Val Lys Lys Ser Phe Gly Arg Lys Lys
945   950   955   960
Arg Glu Val Ser Asn Asn Ile Glu Glu Phe Glu Thr Asn Arg Tyr Leu
              965   970   975
Ile Pro Arg Arg Ser His Ala Thr Thr Ser Ile Val Ile Ile Asp Pro
              980   985   990
Leu Gln Gln Val Asn Glu Pro Val Ala Met Ser Arg Ala Ser Thr Leu
              995   1000   1005
Asp Leu Leu Arg Glu Asp Ala His Glu Val Gln Met Ile Glu Glu Gly
          1010   1015   1020
Ser Ile Cys Leu Asn Ser Val Thr Val Phe Ala Ile Phe Gly Thr Leu
1025   1030   1035   1040
Ala Val Leu Ile Leu Gly Gln Thr Val Val Ile Ala His Tyr Ala Val
              1045   1050   1055
Arg Arg Phe Ser Ser Glu Lys Thr Ala
          1060   1065

<210> 17
<211> 1069
<212> PRT
<213> Caenorhabditis elegans

<400> 17
Met Lys Val Phe Ala Val Leu Ala Leu Val Val Ala Ser Val Leu Ala
 1   5   10   .   15
Asp Thr Leu Pro Ser Val Thr Leu Cys Pro Pro Glu Thr Gln Thr Ile
              20   25   30
Phe Val Leu Gln His Asn Thr Thr Val Gly Ala Arg Ile Arg Thr Ile
          35   40   45

Pro Thr Ser Asn Leu Ala Glu Cys Ser Asp His Cys Ser Ala Ser Leu
   50   55   60

Asp Cys Gln Gly Val Glu Phe Lys Asp Gly Ser Cys Ala Val Phe Arg
65   70   75   80

Ala Gly Ser Glu Lys Ala Thr Ala Gly Ser Gln Leu Leu Thr Lys Thr
            85   90   95

Cys Val Lys Ser Asp Arg Val Cys Gln Ser Pro Phe Gln Phe Asp Leu
           100   105   110

Phe Glu Gln Arg Ile Leu Val Gly Phe Ala Arg Glu Val Val Pro Ala
           115   120   125

Ala Asn Ile Gln Ile Cys Met Ala Ala Cys Leu Asn Ala Phe Asp Thr
   130   135   140

Phe Gly Phe Glu Cys Glu Ser Ala Met Phe Tyr Pro Val Asp Gln Glu
145   150   155   160

Cys Ile Leu Asn Thr Glu Asp Arg Leu Asp Arg Pro Ser Leu Phe Val
          165   170   175

Glu Glu Ser Asp Asp Thr Val Ile Tyr Met Asp Asn Asn Cys Ala Gly
          180   185   190

Phe Pro Leu Val Phe Lys Asn Tyr Asn Tyr Gln Lys Thr Thr Phe Ser
     195   200   205

Lys Ser Gln Cys Tyr Pro Pro Tyr Ile Thr Gln Tyr Ile Ala Val Glu
   210   215   220

Gly Lys Gln Leu Lys Asn Glu Leu Asp Arg Ile Ile Asn Val Asp Leu
225   230   235   240

Asp Ser Cys Gln Ala Leu Cys Thr Gln Arg Leu Ser Ile Ser Ser Asn
          245   250   255

Asp Phe Asn Cys Lys Ser Phe Met Tyr Asn Asn Lys Thr Arg Thr Cys
          260   265   270

Ile Leu Ala Asp Glu Arg Ser Lys Pro Leu Gly Arg Ala Asp Leu Ile
          275   280   285

Ala Thr Glu Gly Phe Thr Tyr Phe Glu Lys Lys Cys Phe Ala Ser Pro
   290   295   300

Asn Thr Cys Arg Asn Val Pro Ser Phe Lys Arg Val Pro Gln Met Ile
305   310   315   320

Leu Val Gly Phe Ala Ala Phe Val Met Glu Asn Val Pro Ser Val Thr
          325   330   335

Met Cys Leu Asp Gln Cys Thr Asn Pro Pro Pro Glu Thr Gly Asp Gly
          340   345   350

Phe Val Cys Lys Ser Val Met Tyr Tyr Tyr Asn Glu Gln Glu Cys Ile
          355   360   365

Leu Asn Ser Glu Thr Arg Glu Ser Lys Pro Glu Leu Phe Ile Pro Glu
   370   375   380

Gly Glu Glu Phe Leu Val Asp Tyr Phe Asp Ile Thr Cys His Leu Lys
385   390   395   400

Gln Glu Lys Cys Pro Thr Gly Gln His Leu Lys Ala Ile Arg Thr Ile
          405   410   415

Asn Ala Ala Leu Pro Glu Gly Glu Ser Glu Leu His Val Leu Lys Ala
          420   425   430

Ser Ala Ala Lys Gly Ile Lys Glu Cys Val Ala Lys Cys Phe Gly Leu
          435   440   445

Ala Pro Glu Lys Cys Arg Ser Phe Asn Tyr Asp Lys Lys Thr Lys Ser
   450   455   460

Cys Asp Leu Leu Tyr Leu Asp Gly His Asn Thr Leu Gln Pro Gln Val
465   470   475   480

Arg Gln Gly Val Asp Leu Tyr Asp Leu His Cys Leu Ala Ala Met Pro
          485   490   495

Leu Val Glu Asn Asp Cys Ser Ala Asn Lys Asp Asp Ala Leu Phe Ser

```
              500                         505                         510
Arg Tyr Leu His Thr Lys Gln Arg Gly Ile Pro Ala Lys Val Tyr Lys
          515                         520                         525
Val Val Ser Leu Asn Ser Cys Leu Glu Val Cys Ala Gly Asn Pro Thr
          530                         535                         540
Cys Ala Gly Ala Asn Tyr Asn Arg Arg Leu Gly Asp Cys Thr Leu Phe
545                         550                         555                         560
Asp Ala Ile Asp Asp Asp Ala Glu Ile Asn Glu His Thr Asp Phe Tyr
                          565                         570                         575
Lys Asn Leu Cys Val Thr Lys Glu Ile Asp Thr Gly Ala Ser Ala Ala
                      580                         585                         590
Ala Asn Val Pro Glu Thr Lys His Arg Val Ser Gly Thr Val Val Glu
                  595                         600                         605
Gly Lys Asp Ser Lys Ser Gln Leu Leu Ala Thr Lys Lys Val Lys Lys
              610                         615                         620
Pro Thr Ile Lys Asn Thr Glu His Arg Arg Ala Pro Glu Ser Thr Val
625                         630                         635                         640
Pro Ile Gly Pro Pro Val Glu Val Lys Ala Glu Ala Ile Gln Thr Ile
                          645                         650                         655
Cys Asn Tyr Glu Gly Ile Lys Val Gln Ile Asn Asn Gly Glu Pro Phe
                      660                         665                         670
Ser Gly Val Ile Phe Val Lys Asn Lys Phe Asp Thr Cys Arg Val Glu
                  675                         680                         685
Val Ala Asn Ser Asn Ala Ala Thr Leu Val Leu Gly Leu Pro Lys Asp
              690                         695                         700
Phe Gly Met Arg Pro Ile Ser Leu Asp Asn Ile Asp Asp Asn Glu Thr
705                         710                         715                         720
Gly Lys Asn Lys Thr Lys Lys Gly Glu Glu Thr Pro Leu Lys Asp Glu
                      725                         730                         735
Ile Glu Glu Phe Arg Gln Lys Arg Gln Ala Ala Glu Phe Arg Asp Cys
                  740                         745                         750
Gly Leu Val Asp Leu Leu Asn Gly Thr Tyr Lys Ser Thr Val Val Ile
              755                         760                         765
Gln Thr Asn Asn Leu Gly Ile Pro Gly Leu Val Thr Ser Met Asp Gln
          770                         775                         780
Leu Tyr Glu Val Ser Cys Asp Tyr Ser Ser Met Leu Gly Gly Arg Val
785                         790                         795                         800
Gln Ala Gly Tyr Asn Met Thr Val Thr Gly Pro Glu Ala Asn Leu Ile
                      805                         810                         815
Gln Pro Arg Gly Lys Ile Glu Leu Gly Asn Pro Val Leu Met Gln Leu
                  820                         825                         830
Leu Asn Gly Asp Gly Thr Glu Gln Pro Leu Val Gln Ala Lys Leu Gly
              835                         840                         845
Asp Ile Leu Glu Leu Arg Trp Glu Ile Met Ala Met Asp Asp Glu Leu
          850                         855                         860
Asp Phe Phe Val Lys Asn Cys His Ala Glu Pro Gly Val Ala Gly Gly
865                         870                         875                         880
Lys Ala Gly Ala Gly Glu Lys Leu Arg Leu Ile Asp Gly Gly Cys Pro
                      885                         890                         895
Thr Pro Ala Val Ala Gln Lys Leu Ile Pro Gly Ala Ile Glu Ile Lys
                  900                         905                         910
Ser Ser Ala Val Lys Thr Thr Lys Met Gln Ala Phe Arg Phe Asp Ser
              915                         920                         925
Ser Ala Ser Ile Arg Val Thr Cys Glu Val Glu Ile Cys Lys Gly Asp
          930                         935                         940
Cys Glu Pro Val Glu Cys Ala Leu Thr Gly Gly Val Lys Lys Ser Phe
945                         950                         955                         960
```

```
Gly Arg Lys Lys Arg Glu Val Ser Asn Asn Ile Glu Glu Phe Glu Thr
        965                 970                     975
Asn Arg Tyr Leu Ile Pro Arg Arg Ser His Ala Thr Thr Ser Ile Val
        980                 985                     990
Ile Ile Asp Pro Leu Gln Gln Val Asn Glu Pro Val Ala Met Ser Arg
        995                 1000                    1005
Ala Ser Thr Leu Asp Leu Leu Arg Glu Asp Ala His Glu Val Gln Met
    1010                    1015                1020
Ile Glu Glu Gly Ser Ile Cys Leu Asn Ser Val Thr Val Phe Ala Ile
1025                    1030                1035                1040
Phe Gly Thr Leu Ala Val Leu Ile Leu Gly Gln Thr Val Val Ile Ala
            1045                1050                1055
His Tyr Ala Val Arg Arg Phe Ser Ser Glu Lys Thr Ala
            1060                1065
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<210> 18
<211> 741
<212> PRT
<213> Caenorhabditis elegans

<400> 18

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Met Trp Gly Val Ile Phe Leu Leu Leu Ser Ile Val Pro Ala Ala Gln
 1              5                   10                  15
Ser Val Phe Glu Cys Ser Ser His Glu Thr Thr Ala Phe Val Arg Ile
            20                  25                  30
Pro Arg Ala Arg Leu Asp Gly Thr Pro Val Val Ile Ser Thr Ala Gly
        35                  40                  45
His Asp Leu Thr Cys Ala Gln Tyr Cys Arg Asn Asn Ile Glu Pro Thr
    50                  55                  60
Thr Gly Ala Gln Arg Val Cys Ala Ser Phe Asn Phe Asp Gly Arg Glu
65                  70                  75                  80
Thr Cys Tyr Phe Phe Asp Asp Ala Ala Thr Pro Ala Gly Thr Ser Gln
            85                  90                  95
Leu Thr Ala Asn Pro Ser Ala Asn Asn Phe Tyr Tyr Glu Lys Thr Cys
            100                 105                 110
Ile Pro Asn Val Ser Ala His Glu Ala Cys Thr Tyr Arg Ser Phe Ser
        115                 120                 125
Phe Glu Arg Ala Arg Asn Thr Gln Leu Glu Gly Phe Val Lys Lys Ser
    130                 135                 140
Val Thr Val Glu Asn Arg Glu His Cys Leu Ser Ala Cys Leu Lys Glu
145                 150                 155                 160
Lys Glu Phe Val Cys Lys Ser Val Asn Phe His Tyr Asp Thr Ser Leu
            165                 170                 175
Cys Glu Leu Ser Val Glu Asp Lys Arg Ser Lys Pro Thr His Val Arg
            180                 185                 190
Met Ser Glu Lys Ile Asp Tyr Tyr Asp Asn Asn Cys Leu Ser Arg Gln
        195                 200                 205
Asn Arg Cys Gly Pro Ser Gly Gly Asn Leu Val Phe Val Lys Thr Thr
    210                 215                 220
Asn Phe Glu Ile Arg Tyr Tyr Asp His Thr Gln Ser Val Glu Ala Gln
225                 230                 235                 240
Glu Ser Tyr Cys Leu Gln Lys Cys Leu Asp Ser Leu Asn Thr Phe Cys
            245                 250                 255
Arg Ser Val Glu Phe Asn Pro Lys Glu Lys Asn Cys Ile Val Ser Asp
            260                 265                 270
Glu Asp Thr Phe Ser Arg Ala Asp Gln Gln Gly Gln Val Val Gly Lys
        275                 280                 285
```

```
Asp Tyr Tyr Glu Pro Ile Cys Val Ala Ala Asp Leu Ser Ser Ser Thr
    290                 295                 300
Cys Arg Gln Gln Ala Ala Phe Glu Arg Phe Ile Gly Ser Ser Ile Glu
305                 310                 315                 320
Gly Glu Val Val Ala Ser Ala Gln Gly Val Thr Ile Ser Asp Cys Ile
                325                 330                 335
Ser Leu Cys Phe Gln Asn Leu Asn Cys Lys Ser Ile Asn Tyr Asp Arg
                340                 345                 350
Thr Ala Ser Ser Cys Phe Ile Tyr Ala Val Gly Arg Gln Asp Ala Asn
                355                 360                 365
Ile Lys Ala Asn Pro Ser Met Asp Tyr Tyr Glu Phe Asn Cys Glu Ser
    370                 375                 380
Gln Phe Gly Gly Met Ala Leu Cys Thr Asn Glu Gly Ile Arg Phe Ile
385                 390                 395                 400
Val Asn Thr Lys Glu Pro Tyr Thr Gly Ala Ile Tyr Ala Ala Glu Arg
                405                 410                 415
Phe Ser Thr Cys Ser Gln Val Val Glu Asn Ala Lys Gln Ile Ser Ile
                420                 425                 430
Thr Phe Pro Pro Pro Thr Val Ser Ser Asp Cys Gly Thr Val Ile Arg
                435                 440                 445
Asp Gly Lys Met Glu Ala Leu Val Val Val Ser Leu Asp Gly Val Leu
    450                 455                 460
Pro His Gln Val Thr Thr Glu Trp Asp Arg Phe Tyr Arg Val Ser Cys
465                 470                 475                 480
Asp Val Ser Met Asp Lys Met Val Lys Glu Gly Ser Val Val Val Thr
                485                 490                 495
Thr Ile Tyr Glu Ala Ser Ser Gln Asn Thr Thr Val Leu Asp Val Ala
                500                 505                 510
Thr Pro Pro Pro Val Ser Ala Glu Leu Gln Ile Leu Asn Gln Leu Glu
                515                 520                 525
Glu Pro Leu His Lys Ala Ser Ile Gly Asp Pro Leu Leu Leu Val Ile
    530                 535                 540
Thr Ser Glu Gln Ala Gly Pro His Asn Met Met Val Thr Glu Cys Thr
545                 550                 555                 560
Ala Thr Arg Val Gly Gly Phe Gly Asp Thr Val Pro Phe Thr Leu Ile
                565                 570                 575
Glu Asn Gly Cys Pro Arg Tyr Pro Ala Leu Val Gly Pro Val Glu Gln
                580                 585                 590
Asp Phe Asp Lys Asn Arg Leu Lys Ser Asp Leu Arg Ala Phe Arg Leu
    595                 600                 605
Asp Gly Ser Tyr Asp Val Gln Ile Val Cys Ser Ile Met Phe Cys Ala
    610                 615                 620
Gly Pro Asn Gly Cys Pro Val Ser Asn Cys Leu Asp Ser Gly Thr Asn
625                 630                 635                 640
Glu Leu Phe Met Ser His Gly Arg Lys Lys Arg Ser Ala Asp Leu Glu
                645                 650                 655
Ala Gly Glu Thr Glu Glu Lys Leu Ser Ala Ile Ile Arg Val Phe Ala
                660                 665                 670
Lys Gly Glu Asp Glu Glu Glu Met Glu Met Ala Asn Asn Thr Met Met
                675                 680                 685
Thr Ser Met Ser Asp Ser Thr Glu Leu Leu Cys Ile Ala Glu Pro Phe
    690                 695                 700
Phe Val Ser Ser Val Val Ser Leu Ser Val Leu Cys Phe Ala Leu Ser
705                 710                 715                 720
Ala Ile Ile Ala Ile Trp Gly Cys His Ser Leu His Ser Lys Pro Val
                725                 730                 735
Lys Gln Val Ala Ala
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740

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<210> 19
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 19
ggccacgcgt cgactagtac                                                    20

<210> 20
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 20
gggtttaatt acccaagttt ga                                                 22

<210> 21
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 21
ggccacgcgt cgactagtac tttttttttt ttttttt                                 37

<210> 22
<211> 44
<212> RNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 22
cgacuggagc acgaggacac ugacauggac ugaaggagua gaaa                         44

<210> 23
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 23
ccgtccaaga ggctttgaac                                                    20
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<210> 24
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 24
gatctggtcg atcaagtc                                              18

<210> 25
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 25
cgactggagc acgaggacac tga                                        23

<210> 26
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 26
ggacactgac atggactgaa ggagta                                     26

<210> 27
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 27
tcagtgacgt tatgtcctcc                                            20

<210> 28
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 28
tgacagatgg aacattctcc                                            20

<210> 29
<211> 20
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<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 29
acttcaggac acgacttgac   20

<210> 30
<211> 20 ·
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 30
caatcagaga tggtaactcc   20

<210> 31
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 31
cgttgtagac agtcgctgag tacata   26

<210> 32
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 32
ccaactcgtt agctagctga cg   22

<210> 33
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 33
cgaacatgtc gcaatgtac   19

<210> 34
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<221> misc_feature
<222> 4
<223> n = a, t, c, or g

<400> 34
catngccatd atytccca   18

<210> 35
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<221> misc_feature
<222> 6
<223> n = a, t, c, or g

<400> 35
ttyggnttyg artgygar   18

<210> 36
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 36
gatcgaggca catcgttac   19

<210> 37
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 37
gtttagatgc tgttgatac   19

<210> 38
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<221> misc_feature

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<222> 9, 15
<223> n = a, t, c, or g

<400> 38
tcdatyttnc cyctnggytg                                        20


<210> 39
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 39
caagatatgg acaatggaac                                        20


<210> 40
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 40
atacattcgg catccaatgg                                        20


<210> 41
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 41
actgactcgc attcaaagcc                                        20


<210> 42
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 42
tagctaatct agctagtgtc                                        20


<210> 43
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer
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<221> misc_feature
<222> 15
<223> n = a, t, c, or g

<400> 43
garcaraara tgctngt   17

<210> 44
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 44
tgytcrttrt artartacat   20

<210> 45
<211> 1068
<212> PRT
<213> Caenorhabditis briggsae

<400> 45
Met Lys Val Phe Ala Val Val Ala Leu Leu Ala Val Ser Ala Leu Ala
 1   5   10   15
Asp Thr Leu Pro Ser Val Thr Ile Cys Pro Pro Glu Thr Gln Thr Ile
            20   25   30
Phe Val Leu Gln His Asn Ser Thr Val Gly Ala Arg Ile Arg Thr Ile
        35   40   45
Pro Thr Ser Asn Leu Ala Glu Cys Ser Asp His Cys Ala Ala Ser Leu
    50   55   60
Asp Cys Gln Gly Val Glu Phe Lys Asp Gly Ser Cys Ala Val Phe Arg
65   70   75   80
Ala Gly Ser Glu Lys Ala Thr Lys Gly Ser Gln Leu Leu Thr Lys Ser
                85   90   95
Cys Val Lys Ser Asp Arg Val Cys Gln Ser Pro Phe Gln Phe Asp Leu
            100   105   110
Phe Glu Gln Lys Ile Leu Val Gly Phe Ala Arg Glu Val Val Pro Ala
        115   120   125
Glu Asn Ile Gln Val Cys Met Ala Ala Cys Leu Asn Ala Phe Asp Thr
    130   135   140
Phe Gly Phe Glu Cys Glu Ser Ala Met Phe Tyr Pro Val Asp Gln Glu
145   150   155   160
Cys Ile Leu Asn Thr Glu Asp Arg Leu Asp Arg Pro Ser Leu Phe Val
                165   170   175
Asp Glu Ala Asp Asp Thr Val Ile Tyr Met Asp Asn Asn Cys Ala Gly
            180   185   190
Cys Lys Phe Gln Asn Pro Cys Ser His Val Asp Leu Tyr Phe Ser Leu
        195   200   205
Ala Gln Cys Tyr Pro Pro Tyr Ile Thr Gln Tyr Ile Ala Val Glu Gly
    210   215   220
Lys Gln Leu Lys Asn Glu Leu Asp Arg Ile Ile Asn Val Asp Leu Asp
225   230   235   240
Ser Cys Gln Ala Leu Cys Thr Gln Arg Leu Ser Ile Ser Ser Asn Asp
                245   250   255

```
Phe Asn Cys Lys Ser Phe Met Tyr Asn Asn Lys Thr Arg Thr Cys Ile
        260                 265                 270
Leu Ala Asp Glu Arg Ser Lys Pro Leu Gly Arg Ala Asp Leu Val Ala
        275                 280                 285
Thr Glu Gly Phe Thr Tyr Phe Glu Lys Lys Cys Phe Ala Ser Pro Asn
    290                 295                 300
Thr Cys Arg Asn Val Pro Ser Phe Lys Arg Val Pro Gln Met Ile Leu
305                 310                 315                 320
Val Gly Phe Ala Ala Phe Val Met Glu Asn Val Pro Ser Val Thr Met
                325                 330                 335
Cys Leu Asp Gln Cys Thr Asn Pro Pro Pro Glu Thr Gly Asp Gly Phe
            340                 345                 350
Val Cys Lys Ser Val Met Tyr Tyr Tyr Asn Glu Gln Glu Cys Ile Leu
            355                 360                 365
Asn Ser Glu Thr Arg Glu Ser Lys Pro Glu Leu Phe Ile Pro Glu Gly
    370                 375                 380
Glu Glu Phe Leu Val Asp Tyr Phe Asp Ile Thr Cys His Leu Lys Gln
385                 390                 395                 400
Glu Lys Cys Pro Ala Gly Gln His Leu Lys Ala Ile Arg Thr Ile Asn
            405                 410                 415
Ala Ala Leu Pro Glu Gly Glu Ser Glu Leu His Val Leu Lys Ser Ser
            420                 425                 430
Ala Ala Lys Gly Ile Lys Glu Cys Val Ala Lys Cys Phe Gly Leu Ala
            435                 440                 445
Pro Glu Lys Cys Arg Ser Phe Asn Tyr Asp Lys Lys Thr Lys Ser Cys
    450                 455                 460
Asp Leu Leu Tyr Leu Asp Gly His Asn Thr Leu Gln Pro Gln Val Arg
465                 470                 475                 480
Gln Gly Val Asp Leu Tyr Asp Leu His Cys Leu Ala Ala Leu Pro Leu
            485                 490                 495
Val Glu Asn Asp Cys Ser Ala Asn Lys Asp Asp Ala Leu Phe Ser Arg
            500                 505                 510
Tyr Leu His Thr Lys Gln Arg Gly Ile Pro Ala Lys Ser Tyr Lys Val
        515                 520                 525
Val Ser Leu Asn Ser Cys Leu Glu Val Cys Ala Gly Asn Pro Thr Cys
        530                 535                 540
Ala Gly Ala Asn Tyr Asn Arg Arg Leu Gly Asp Cys Ser Leu Phe Asp
545                 550                 555                 560
Ala Ile Asp Lys Asp Ala Glu Val Asn Glu His Thr Asp Phe Tyr Lys
            565                 570                 575
Asn Leu Cys Val Thr Lys Glu Val Asp Thr Gly Ala Ser Ala Ala Ala
            580                 585                 590
Asn Val Pro Glu Thr Lys His Arg Val Ser Gly Thr Val Val Glu Gly
        595                 600                 605
Lys Asp Ser Lys Ala Gln Leu Leu Ala Thr Lys Lys Val Lys Lys Pro
        610                 615                 620
Thr Ile Lys Asn Thr Glu His Arg Arg Ala Pro Glu Ser Thr Val Pro
625                 630                 635                 640
Leu Gly Pro Pro Val Glu Val Lys Ala Glu Ala Ile Gln Thr Ile Cys
            645                 650                 655
Asn Tyr Glu Gly Ile Lys Val Gln Ile Asn Asn Gly Glu Pro Phe Ser
            660                 665                 670
Gly Val Ile Phe Val Lys Asn Lys Phe Asp Thr Cys Arg Val Glu Val
        675                 680                 685
Ala Asn Ser Asn Ala Ala Thr Leu Val Leu Gly Leu Pro Lys Asp Phe
        690                 695                 700
Gly Met Arg Pro Ile Ser Leu Asp Asn Leu Asp Asp Asn Glu Thr Gly
```

```
705                     710                     715                     720
Lys Asn Lys Thr Lys Lys Gly Glu Glu Thr Pro Leu Lys Glu Glu Ile
                    725                     730                     735
Glu Glu Phe Arg Gln Lys Arg Gln Ala Ala Glu Phe Arg Asp Cys Gly
                740                     745                     750
Leu Val Asp Leu Leu Asn Gly Thr Tyr Lys Ser Thr Val Val Ile Gln
            755                     760                     765
Thr Asn Asn Leu Gly Ile Pro Gly Leu Val Thr Ser Met Asp Gln Leu
        770                     775                     780
Tyr Glu Val Ser Cys Asp Tyr Ser Ser Met Leu Gly Gly Arg Val Gln
785                     790                     795                     800
Ala Gly Tyr Asn Met Thr Val Thr Gly Pro Glu Ala Asn Leu Ile Gln
                805                     810                     815
Pro Arg Gly Lys Ile Glu Leu Gly Asn Pro Val Leu Met Gln Leu Leu
                820                     825                     830
Asn Gly Asp Gly Thr Glu Gln Pro Leu Val Gln Ala Lys Leu Gly Asp
            835                     840                     845
Ile Leu Glu Leu Arg Trp Glu Ile Met Ala Met Asp Asp Glu Leu Asp
        850                     855                     860
Phe Phe Val Lys Asn Cys His Ala Glu Pro Gly Leu Ala Gly Gly Lys
865                     870                     875                     880
Ala Gly Ala Gly Glu Lys Leu Gln Leu Ile Asp Gly Gly Cys Pro Thr
                885                     890                     895
Pro Ala Val Ala Gln Lys Leu Ile Pro Gly Ala Ile Glu Val Lys Ser
            900                     905                     910
Ser Ala Val Lys Thr Thr Lys Met Gln Ala Phe Arg Phe Asp Ser Ser
            915                     920                     925
Ala Ser Ile Arg Val Thr Cys Glu Val Glu Ile Cys Lys Gly Asp Cys
        930                     935                     940
Glu Ala Val Glu Cys Ala Leu Thr Gly Gly Val Lys Lys Ser Phe Gly
945                     950                     955                     960
Arg Lys Lys Arg Glu Val Asn Asn Asn Ile Glu Glu Phe Glu Thr Asn
                965                     970                     975
Arg Tyr Leu Ile Pro Arg Arg Ser His Ala Thr Thr Ser Ile Val Ile
            980                     985                     990
Ile Asp Pro Leu Gln Gln Val Asn Glu Pro Val Ala Met Ser Arg Ala
            995                     1000                    1005
Ser Thr Leu Asp Leu Leu Arg Glu Glu Ala His Glu Val Gln Val Ile
        1010                    1015                    1020
Glu Glu Gly Ser Ile Cys Leu Asn Arg Ile Thr Val Phe Ala Ile Phe
1025                    1030                    1035                    1040
Gly Thr Leu Ala Val Leu Ile Leu Gly Gln Val Ile Val Val Ala His
                1045                    1050                    1055
Tyr Ala Val Arg Arg Phe Ser Thr Glu Lys Thr Ala
            1060                    1065
```

```
<400> 46
Met Ser Pro Arg Val Ile Phe Leu Leu Leu Gly Ser Phe Leu Thr Ala
 1                   5                   10                      15
Gln Ala Val Phe Glu Cys Ser Ser His Glu Thr Thr Ala Phe Val Arg
                20                      25                      30
Ile Pro Arg Ala Arg Leu Asp Gly Thr Pro Val Val Ile Ser Thr Ala
```

```
              35                      40                      45
Gly His Asp Leu Thr Cys Ala Gln Tyr Cys Arg Asn Asn Ile Glu Pro
    50                      55                      60
Thr Thr Gly Ala Gln Arg Val Cys Ala Ser Phe Asn Phe Asp Gly Arg
65                      70                      75                      80
Glu Thr Cys Tyr Phe Phe Asp Asp Ala Ala Thr Pro Ala Gly Thr Ser
                85                      90                      95
Gln Leu Thr Ala Asn Pro Ser Ala Asn Asn Phe Tyr Tyr Glu Lys Thr
                100                     105                     110
Cys Ile Pro Asn Val Ser Ala His Glu Ala Cys Thr Tyr Arg Ser Phe
                115                     120                     125
Ser Phe Glu Arg Ala Arg Asn Thr Gln Leu Glu Gly Phe Val Lys Lys
    130                     135                     140
Ser Val Thr Val Lys Asn Arg Glu His Cys Leu Ser Ala Cys Leu Lys
145                     150                     155                     160
Glu Lys Glu Phe Val Cys Lys Ser Val Asn Phe His Tyr Glu Asn Ser
                165                     170                     175
Leu Cys Glu Leu Ser Val Glu Asp Lys Arg Ser Lys Pro Thr His Val
                180                     185                     190
Arg Met Ser Glu Gly Ile Asp Tyr Tyr Asp Asn Asn Cys Leu Ser Arg
                195                     200                     205
Gln Asn Arg Cys Gly Pro Ser Gly Gly Asn Leu Val Phe Val Lys Thr
    210                     215                     220
Thr Asn Phe Glu Ile Arg Tyr Tyr Asp His Thr Gln Ser Val Glu Ala
225                     230                     235                     240
Gln Glu Ser Tyr Cys Leu Gln Lys Cys Leu Asp Ser Leu Asn Thr Phe
                245                     250                     255
Cys Arg Ser Val Glu Phe Asn Pro Lys Glu Lys Asn Cys Ile Val Ser
                260                     265                     270
Asp Glu Asp Thr Phe Ser Arg Ala Asp Gln Gln Gly Gln Val Val Gly
                275                     280                     285
Lys Asp Tyr Tyr Glu Pro Ile Cys Val Ala Ala Asp Leu Ser Ser Ser
    290                     295                     300
Thr Cys Arg Gln Gln Ala Ala Phe Glu Arg Phe Ile Gly Ser Ser Ile
305                     310                     315                     320
Glu Gly Glu Val Val Ala Ser Ala Gln Gly Val Thr Ile Ser Asp Cys
                325                     330                     335
Ile Ser Leu Cys Phe Gln Asn Leu Asn Cys Lys Ser Ile Asn Tyr Asp
                340                     345                     350
Arg Thr Ala Ser Ser Cys Phe Ile Tyr Ala Val Gly Arg Gln Asp Ala
    355                     360                     365
Asn Ile Lys Ala Asn Pro Ser Met Asp Tyr Tyr Glu Phe Asn Cys Glu
    370                     375                     380
Ser Gln Phe Gly Gly Met Ala Leu Cys Thr Asn Glu Gly Ile Arg Phe
385                     390                     395                     400
Ile Val Asn Thr Lys Glu Pro Tyr Thr Gly Ala Ile Tyr Ala Ala Glu
                405                     410                     415
Arg Phe Ser Thr Cys Ser Gln Val Val Glu Asn Ala Lys Gln Ile Ser
                420                     425                     430
Ile Thr Phe Pro Pro Pro Thr Val Thr Ser Asp Cys Gly Thr Val Ile
                435                     440                     445
Arg Asp Gly Lys Met Glu Ala Leu Val Val Val Ser Leu Asp Gly Val
    450                     455                     460
Leu Pro His Gln Val Thr Thr Glu Trp Asp Arg Phe Tyr Arg Val Ser
465                     470                     475                     480
Cys Asp Val Ser Met Asp Lys Met Val Lys Glu Gly Ser Val Val Val
                485                     490                     495
```

```
Thr Thr Ile Tyr Glu Ala Ser Ser Gln Asn Thr Thr Val Leu Asp Val
        500                 505                 510
Ala Thr Pro Pro Pro Val Thr Ala Glu Leu Gln Ile Leu Asn Gln Leu
        515                 520                 525
Glu Glu Pro Leu His Lys Ala Ser Ile Gly Asp Pro Leu Leu Leu Val
        530                 535                 540
Ile Thr Ser Glu Gln Ala Gly Pro His Asn Met Met Val Thr Glu Cys
545                 550                 555                 560
Thr Ala Thr Arg Val Gly Gly Phe Gly Asp Thr Val Pro Phe Thr Leu
        565                 570                 575
Ile Glu Asn Gly Cys Pro Arg Tyr Pro Ala Leu Val Gly Pro Val Glu
        580                 585                 590
Gln Asp Phe Asp Lys Asn Arg Leu Lys Ser Asp Leu Arg Ala Phe Arg
        595                 600                 605
Leu Asp Gly Ser Tyr Asp Val Gln Ile Val Cys Ser Ile Met Phe Cys
        610                 615                 620
Ala Gly Pro Asn Gly Cys Pro Val Ser Asn Cys Leu Asp Ser Gly Thr
625                 630                 635                 640
Asn Glu Leu Phe Met Ser His Gly Arg Lys Lys Arg Ser Val Asp Leu
        645                 650                 655
Glu Ala Gly Glu Thr Glu Glu Arg Leu Ser Ala Ile Ile Arg Val Phe
        660                 665                 670
Ala Lys Gly Glu Asp Glu Glu Glu Ile Glu Met Gly Asn Asn Thr Leu
        675                 680                 685
Met Thr Ser Leu Ala Glu Ser Thr Asp Leu Leu Cys Ile Ala Glu Pro
        690                 695                 700
Phe Phe Val Ser Ser Val Val Ser Leu Ser Val Leu Cys Phe Ala Leu
705                 710                 715                 720
Ser Ala Ile Ile Ala Ile Trp Gly Cys His Ala Leu His Ala Lys Pro
        725                 730                 735
Thr Lys Gln Val Ala Ala
        740
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<210> 47
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 47
gtaatacgac tcactatagg gc   22

<210> 48
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 48
aattaaccct cactaaaggg   20

<210> 49
<211> 19

<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 49
gatttaggtg acactatag   19

<210> 50
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 50
ggccacgcgt cgactagtac ggggggggg   29

<210> 51
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 51
tcagtgacgt tatgtcctcc   20

<210> 52
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 52
tgacagatgg aacattctcc   20

<210> 53
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 53
acttcaggac acgacttgac   20

<210> 54
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 54
caatcagaga tggtaactcc   20